MINUTES

MONTANA SENATE
52nd LEGISLATURE - REGULAR SESSION

COMMITTEE ON BUSINESS & INDUSTRY

Call to Order: By Chairman J.D. Lynch, on February 14, 1991, at 10:00 a.m.

ROLL CALL

Members Present:
J.D. Lynch, Chairman (D)
John Jr. Kennedy, Vice Chairman (D)
Betty Bruski (D)
Eve Franklin (D)
Delwyn Gage (R)
Thomas Hager (R)
Jerry Noble (R)
Gene Thayer (R)
Bob Williams (D)

Members Excused: None

Staff Present: Bart Campbell (Legislative Council).

Please Note: These are summary minutes. Testimony and discussion are paraphrased and condensed.

Announcements/Discussion: None

HEARING ON SENATE BILL 242

Presentation and Opening Statement by Sponsor:

Senator Bruce Crippen, sponsor of the bill, stated that this bill was by request of the governor. In 1985, the Montana board of science and technology development was created. The board's mission was to strengthen and diversify the state's economy by facilitating a public private sector relationship. Over the past five years the alliance has invested approximately one point five million dollars for businesses with private financing, and two point six million dollars in research and development projects. This bill will provide five point one million dollars in research and development project loans. There are three major areas of funding that is represented in the five point one million dollars-the engineering and research center on Montana state university, national science foundation projects in Montana, and the medical facilities for research and development projects.

Proponents' Testimony:

Representative Dorothy Bradley, district 79 in Bozeman, spoke in favor of the bill. Since 1985 our legislature has had a very enthusiastic and a very successful effort coalitions supporting the Montana science and technology developments in Montana. This bill is to reinstitute and expand what we started out with in 1985. Research and development is a key part of any science and technology program in Montana. It is in essence the first link of a long chain of trying to develop and find new products that will solve Montana's problems, it will create commercial opportunities, and create jobs for our young people.

Chuck Brooke, director of the department of commerce, stated that the administration strongly supports this bill. He called the committee's attention to the winter issue of the Montana business quarterly, the feature issue is the high tech industry in Montana. Montana state university has had twenty six patents due to their research. There are six start up companies that are derived from this research.

Annie Bartose, a member of the board of science and technology, she stated that the chairman of the board was not able to attend the committee hearing today so she read his testimony for him (See Exhibit 1).

Carl Russell, executive director of the Montana science and technology alliance, spoke in favor of the bill (See Exhibit 2 and Exhibit 2A).

David Toppen, deputy commissioner for academic affairs for the university system of Montana and a member of the Montana science and technology advisory board, spoke in favor of the bill. The university system is involved in what will hopefully become a long term productive partnership with the department of commerce, and with the business community in the state of Montana. A major fraction of the funding that the committee is asked to approve of today, is devoted to research programs that are conducted on the campus and managed by the Montana university system. Part of the funding will support the experimental program to stimulate competitive research. He submitted a letter from Andre Corbeau for the center of entrepreneurship at the Billings eastern Montana college (See Exhibit 3).

Jon Marchi, representing himself and the Montana private capital network as a director and officer, spoke in favor of the bill (See Exhibit 4).

Kay Lutz-Ritzheimer, executive director Montana entrepreneurship center, spoke in favor of the bill (See Exhibit 5, Exhibit 5A, Exhibit 5B).

Ann P. Keenan, Bozeman director Montana entrepreneurship center, Montana state university, spoke in favor of the bill (See Exhibit 6).

Richard Larson, mayor of Billings, spoke in favor of the bill (See Exhibit 7).

Jay Kirkpatrick, Ph.D., vice president board of directors Deaconess research institute; associate professor of physiology, department of biological sciences, eastern Montana college, spoke in favor of the bill (See Exhibit 8).

Richard Potter, Ph.D., vice president of research and development for basic bio systems, inc., spoke in favor of the

bill (See Exhibit 9).

Pete Thatcher, representing the engineering research center, Montana state university, spoke in support of the bill (See Exhibit 10).

Al Swanson, representing the deaconess research institute, spoke in favor of the bill (See Exhibit 11 and Exhibit 11A).

George Carlson, director of McLaughlin research institute in Great Falls, he stated that if investigators can see that the state is willing to support the research institute it could be a major factor in recruiting procedures into the state.

Samuel Worcester, director of advanced minerals and hazardous waste processing center of excellence, Montana tech, submitted written testimony in support of the bill (See Exhibit 12).

Walt Hill, director of center of biotechnology, spoke in favor of the bill. The present budget indicates that four point one billion dollars of federal money is going to be spent in the next year to enhance biotechnology. Thirty four states in the union have biotechnology centers, generally they are supported in the area on one point seven million dollars per year, per center. Mr. Hill quoted Dan Quayle in saying, "We'll continue to work on strategy to achieve potential help by biotechnology research. Biotechnology is a science and industry projected to reach fifty billion dollars by the end of the decade."

Dixie Swenson, executive director of the Gallatin development corporation in Missoula, stated that they are in strong support.

Steve Huntington, representing the Montana technology companies, stated that they are in support of the bill.

Chris Gallus, director of the business development center in Butte, stated that he supports SB 242.

Kay Foster, Billings area chamber of commerce, stated that they are in support of the bill.

Jim Smitham, economic development specialist, Montana power company, stated that they support the bill.

Buck Boles, president of the Montana chamber, stated that he is in support of the bill.

Edward Dratz, professor of chemistry, Montana state university, spoke in favor of the bill (See Exhibit 13).

Opponents' Testimony:

None

Questions From Committee Members:

Senator Franklin asked if Jon Marchi could comment further on the research and development grant that he had commented on earlier.

Jon Marchi stated that approximately two tenths of 1% actual cash returned to date from January 31, 1991. There are no cash returns on most loans.

Senator Thayer stated that there was twenty six patents that resulted in six start up companies here in Montana as stated in testimony. He asked what happened to the other twenty patents.

Carl Russell stated that there is an addition towards the end of the bill that is the whole control of the intellicular property process. It is in that process that the university internally are going to be able to create those patents, and put them in a position to bring them out of the companies.

Senator Thayer asked if Carl Russell was in support of the amendments offered.

Carl Russell stated that he hadn't seen the amendments, but had heard them in testimony and is in support.

Closing by Sponsor:

Senator Crippen closed.

ADJOURNMENT

Adjournment At: 11:45 a.m.

J.D. LYNCH, Chairman

DARA ANDERSON, Secretary

JDL/dia

DATE ____________

COMMITTEE ON BUSINESS & INDUSTRY

VISITORS' REGISTER

NAME	REPRESENTING	BILL #	Check One Support	Oppose
JON MARCHI	SELF, MT. PRIVATE CAP. NET.	242	✓	
Ann Keenan	BOZEMAN DIR., MONTANA ENTREPRENEURSHIP CENTER	242	✓	
Angie Swenson	Gallatin Dev. Corp.	242	✓	
George Carlson	McLaughlin Res.	242	✓	
Kay Lutz-Ritzheimer	MT. ENTREPRENEURSHIP CTR	242	✓	
Gerald Peterson	MT Rural Water	SB271	✓	
Chuck Brooke	Commerce Dept	SB242	✓	
Chris Gallus	Butte-Silver Bow BDC	SB242	✓	
Samuel Hubbard	Mountain West Partners	SB242	✓	
Jay F. Kirkpatrick	Deaconess Res. Institute	SB 242	✓	
Joe Swenson	Deaconess Research Institute	SB 242	✓	
David L Toppen	OCHE	242	✓	
Edward Dratz	Montana State Univ.	242	✓	
Earl Russell	Sci + Tech Alliance	242	✓	
Sam Moretto	Center of Excellence Haz Waste + Mineral Processing	242		
R.A. Thatcher	Engineering Research Center MSU	242	✓	
Harry Walther	EPSCOR - Dept of Math MSU	242	✓	
Carl Windler	Deaconess Research Institute	242		
Dick Larsen	Mayor City of Billings	242	✓	
Buck Boles	MT CHAMBER	242	✓	
Laurie Shadoan	Bozeman Chamber	242	✓	
Kay Foster	Billings Chamber	242	✓	
Steve Huntington	Montana Technology Companies	242	✓	
Jim Smitham	MONTANA POWER COMPANY	242	✓	
DAN WALKER	US WEST COMM	242	✓	
DAVE BROWN	HD #72	242	✓	

(Please leave prepared statement with Secretary)

DATE _____

COMMITTEE ON _____

VISITORS' REGISTER

NAME	REPRESENTING	BILL #	Check One	
			Support	Oppose
DAVE FISHER	MT TECH CITIZEN Supp Comm	242	✓	

(Please leave prepared statement with Secretary)

SENATE BUSINESS & INDUSTRY
EXHIBIT NO. 1
DATE 2/14/91
BILL NO. SB242

STATEMENT OF
Chase Hibbard, Chairman
Montana Board of Science and Technology Development

PREPARED FOR THE
Senate Business and Industry
February 14, 1991

on
SB242

Our old research and development portfolio was funded with an appropriation and payback history to date has been 2/10th of one percent. All these loans were made before the White decision under less strict lending criteria. As a result of the White decision, the Supreme Court required specific criteria to be followed when making research and development loans.

A new structure of disbursements is now required and our lending activities will be different than the loans made under our previous research and development portfolio. Our new criteria does not refer to grants. Section 90-3-505 and 506, which set forth goals and criteria for making research and development loans, refer specifically to loans. Carl Russell will provide specifics on these in his testimony. Section 90-3-524, specifically calls for research and development loans to be structured as contracted debt with a "payback of two times the original amount paid as a percentage of the income stream derived from sales or other commercialization of products or processes developed with the Board's financing." The section goes on to allow 10 percent of our annual allocation of research and

development funds to be exempt from monetary payback as long as they are used for technology transfer and technical assistance and indirect benefits such as job creation can be considered as payback.

Under the old portfolio with less strict criteria and funded by an appropriation, it was easier to justify payback in terms of indirect benefits of job creation or furthering the goals of technology development and research. The new post White decision criteria are more strict only allowing loans to be made with monetary payback requirements on 90 percent of the dollars disbursed. This Board takes its statutory responsibilities very seriously, and particularly in light to the fact that SB242 is not an appropriations bill. We do not intend to make grants under our research and development portfolio, but will follow the statutory guidelines carefully.

Thank you for your attention and I am sorry for my inadvertent absence.

ROLL CALL

Business&Industry COMMITTEE

DATE 2/14/91

____ LEGISLATIVE SESSION ____

NAME	PRESENT	ABSENT	EXCUSED
Senator Bruski	X		
Senator Franklin	X		
Senator Gage	X		
Senator Hager	X		
Senator Noble	X		
Senator Thayer	X		
Senator Williams	X		
Senator Kennedy	X		
Senator Lynch	X		

Each day attach to minutes.

SENATE BUSINESS & INDUSTRY
EXHIBIT NO. 2
DATE 2/14/91
BILL NO. SB 242

Testimony in Support of MSTA Research and Development Program Financing-SB 242

I. Introduction

Dear Mr. Chairman, members of the committee and ladies and gentlemen, my name is Carl Russell, and I am the Executive Director of the Montana Science and Technology Alliance. For those of you who may not be familiar with the Alliance, I will take a few moments to briefly describe the program.

The Montana Science and Technology Alliance is an agency connected to the Montana Department of Commerce. The Alliance was originally founded to strengthen the state's economy through the use and development of innovative technology. Historically, Montana's economy has been based on resource extraction and agriculture. It is the state's policy to enhance these basic industries by adding value to Montana's natural resources, and at the same time diversify the state's economy.

The Alliance manages two investment funds. The largest and most prominent fund is the "Seed Capital Investment Fund". This fund consists of $7.5 million from the State Coal Severance Tax Trust Fund. From this fund, MSTA makes investments in new and expanding Montana companies which are engaged in developing and marketing technology-based products or processes. To meet its legislative

mandate to receive a market rate of return while helping to improve the Montana economy, MSTA makes its investments in the same manner as private sector venture capital firms. This manner of operating makes MSTA unique in Montana and the northern Rocky Mountain region because no other organization in this region conducts itself as a venture capital investor. Since its inception in 1985, the program has placed $1.9 million in seed capital financing in Montana businesses.

The Alliance's other program, which is the subject of the legislation before you, is the Research and Development Program. This program's funding is used for projects which generally benefit the state's capabilities in the areas of technology development and entrepreneurial enterprise. To manage this fund, MSTA works closely with the Montana University System and other private and public research institutions. The Alliance is currently concentrating on five projects to achieve the greatest impact from the limited funding in this program and to involve as much of the state's research community as possible. Those projects include the "Centers of Excellence" in Biotechnology involving the University of Montana and Montana State University; Minerals and Hazardous Waste Processing involving the Montana College of Mineral Science and Technology, MSU, and UM; Advanced Materials involving MSU and Tech; the Center for Interfacial Microbial Process Engineering at MSU; and the Montana Entrepreneurship Center involving the Schools of Business Administration at UM, MSU, and Eastern Montana College. I must say, however, that the R and D program up to this point was not

implemented under the very strict criteria which you all set up for Montana Science and Technology in 1989. The early R and D program did not have the same concerns for payback to the state that I will mention later in my remarks.

Since 1985, $2.6 million has been advanced for research and development, matching $2.9 million in non-state appropriated sources. The Alliance's research and development fund and seed capital fund are intended to complement one another; that is, applied research projects may be commercialized using seed capital funding from the Alliance. However, in recent years the Alliance has had limited funds to direct towards its research and development efforts. (Refer to the Biennial Report attached)

As part of the process to move Montana and its science and technology development forward into the 1990's and the twenty-first century, the Governor issued an Executive Order creating the Montana Science and Technology Advisory Council in October of 1990. The purpose of the council is twofold. First, to develop and recommend a state science and technology plan to the MSTA board. After approval by the Board, the plan will be presented to the Governor and forwarded to you in the legislature. Second, the council will review and comment to MSTA on specific applications for research and development projects.

II. The Legislation

The proposed legislation will allow the Alliance to continue with

its research and development efforts, and implement the recommendations of the science and technology development plan.

Specifically, the legislation would make available $5.1 million from the in-state investment fund for research and development project loans, pursuant to the provisions of Title 90, chapter 3. The MSTA board could loan these funds during the biennium ending June 30, 1993. There is approximately $60 million in the in-state investment fund, $20 million of which is in short-term investments. The $5.1 million in this legislation, would, during the biennium, be drawn from the short-term investment pool.

Out of the $5.1 million, $600,000 will be used to meet matching fund requirements for the National Science Foundation award to the Center for Interfacial Microbial Process Engineering at MSU. This Center has already received a $7.5 million commitment from NSF. $3.5 million will be used for loans to NSF's Experimental Program to Stimulate Competitive Research, the Montana Entrepreneurship Center, the Montana Centers of Excellence, and other MSTA research and development project loans. Last, $1 million will be available for medical facility research and development project loans. All of these loans will be made pursuant to The Montana Science and Technology Financing Act passed by the legislature in 1989. The Act governs MSTA regarding criteria for funding. I will spell out this criteria for you in a few minutes.

The funding provided in this legislation is critical to the improvement of Montana's educational infrastructure. The research supported by this funding will attract and retain high-quality faculty, researchers and students, will enhance the University System's reputation, and will ensure the continued flow of Federal grant money into the state. Such funding will increase the collaboration between business and university researchers which tends to commercialize products and processes even quicker.

But the primary purpose of the legislation is not simply to improve the research capabilities of the University System. The program will result in many other positive impacts for the state of Montana. Importantly, the research and development program is designed to provide financing opportunities to the MSTA seed capital fund by increasing its deal flow. Applied research projects will be targeted, and priority will be given to projects that will have the potential for commercialization. Applied research that is funded will result in the generation of a commercially viable product or process, around which a company can be formed, creating an investment opportunity for the Alliance's seed capital fund.

An example of this is a $52,600 loan made to the phyto availability soil test project at MSU under the direction of Dr. Earl Skogley. This research project has matured to the point that a business plan is being written to create a company commercializing the soil test. If the Alliance's investment criteria are met, seed capital funding can be made available to the company. Obviously, investment in an

early-stage, technology-based company which reaches a significant level of success would have many benefits for the state's economy.

Another example of the Alliance's research and development efforts is the loan made to Western Energy Company in 1986. In that year, the Alliance placed $350,000 in the company to conduct research and engineering studies on the coal conversion process. The conversion process takes low quality coal and increases its heating value by reducing moisture, ash, and the sulfur content. Last year, it was announced that the DOE would finance $34 million of the cost of a five year demonstration project. The immediate benefits to the Montana economy and potential benefits to the Montana coal industry will be significant.

A successful research and development program will employ people, will generate state and local taxes, will use local contractors, will result in the purchase of equipment and supplies, will increase the number of visitors to the state, resulting in increased tourism and conferences, and will benefit a variety of business spin-offs in the local economies.

These loans will not only be directed toward applied research projects, but will have payback provisions designed to preserve the in-state investment fund. In the recent past, the Alliance has required a payback on its research and development project loans. Generally, these terms have stated that a royalty be paid to the Alliance upon the commercialization resulting from the research

conducted. The Alliance will continue to loan funds under such terms that assure a payback will come to the state from successful projects.

The time frame associated with payback of the loans is long-term. The primary purpose of the loans is not to generate income such as a loan from a conventional financial institution; rather the primary purpose is to promote the development of research and development infrastructure in the state and to create technologies that have commercial potential.

Realizing commercial potential will take many months and often years. The particular research products must find, not only a fit within the marketplace, but also will need a home from which to be developed. In other words, either a company will need to be created or an existing company would need to buy a license to develop, market and sell the product. Reaching this stage of development is a tedious and purposeful process leading to the point where a viable business entity can gain profits from the sale of the products and thereby generate returns to the researcher, the university and the state. Because of this situation it is incumbent upon the Science and Technology Board to select those research and development projects that will tend to reach the marketplace quicker and could have a higher potential for success. Such selectivity certainly is possible and is the goal of the Alliance. Not only are we charged with creating the economic benefits I have mentioned but we also have the fiduciary responsibility to the in-state investment fund to

protect and grow its corpus.

Because of the White case, which struck down Montana Science and Technology Alliance's original funding methodolgies, in 1989, the criteria used by the Montana Science and Technology Development Board in approving both Seed Capital and R and D projects were tightened substantially. The Board cannot do grants. The Board cannot do loans that look like grants. They can only invest monies into R and D projects that meet very strict goals and criteria spelled out in the existing legislation, i.e., Section 90-3.MCA. These goals and criteria will lead to the development of an R and D program that will create payback to the instate investment fund.

Very specifically the following must be met:

General Criteria-projects to be favorable determined as:

(a) consistent with the general legislative findings,
(b) tending toward collaboration b/t public and private sectors,
(c) having prospects of achieving commercial success and creating jobs,
(d) has potential for commercial success for the product or process proposed,
(e) having ability to provide matching funds, and
(f) having a management structure to assure continued involvement by MSTA.

Criteria for making R and D loans:

(a) project will diversify and add value to basic industry,
(b) a clear path to commercialization is evident,
(c) a university involvement exists wherever practical,
(d) project takes advantage of existing R and D strengths within state (university and/or private),

(e) project has a realistic and achievable design,
(f) project develops or employs innovative technology,
(g) project is located in the state, and
(h) project team possesses the sufficient and appropriate expertise.

Loan agreements must contain the following:

(a) budget,
(b) milestones (financing, commercialization, etc.),
(c) certain reports (esp. commercialization progress),
(d) disbursement for the loan,
(e) payback to MSTA,
(f) default provisions, and
(g) intellectual property provisions.

As you can see these are loans that must meet very tight criteria to gain Montana Science and Technology Alliance funding. There is, through this methodology, a very clear path created within this program for the state to receive payback.

An additional item in the legislation that will help to assure payback to the state is the requirement placed upon the University System to assess and restructure their management of intellectual property. Intellectual property management is a process whereby the research, inventions, etc. are protected through patents, copyrights, trademarks or trade secrets. The Alliance will be working with the University System to create a system that is fair and equitable to all those participating: faculty, researchers, collegiate departments, the university units and the state. The purpose is to support positive, first-rate research that will lead to creation of wealth here in Montana.

Financing programs similar to the one proposed in the legislation have been instituted in other states, such as the Pennsylvania Ben Franklin Partnership, Thomas Edison in Ohio, etc., with positive financial benefits deriving to the states. These are not only the economic development benefits I mentioned but also wealth returned through patents, licenses and financial payback to the state treasuries.

Over a ten-year period, it is our best estimate that the $5.1 million in principal and $2.0 million in interest will be earned as a result of the loan program. However, the benefits to the state will not come solely in the form of interest payments, but also in the building of the research and development infrastructure within the University System and the creation of technology-based businesses as a result of the financing.

III. Conclusion

The Alliance has been given the mission of funding applied research, transferring technology with commercial potential, and funding early stage technology-based companies. This mandate is provided in the Alliance's enabling legislation. We have a track record of funding applied research and placing equity-style financing in early stage technology-based companies. However, the Alliance and our partners in the University System and in Montana's businesses have operated with minimum levels of research and development funding. This legislation will give the Alliance the tools it needs to carry out this mandate.

Science & Technology Alliance

1991 BIENNIAL REPORT

MONTANA
Entrepreneurship Center


Kay Lutz-Ritzheimer

Higher education can play a significant role in economic development as demonstrated by other states across the nation. The newly-established Montana Entrepreneurship Center will use the strengths of Montana's university system to address business development and economic diversification, creating the infrastructure necessary to encourage and support entrepreneurship and small-business development.

The center is the cooperative effort of the University of Montana, Montana State University, and Eastern Montana College and is funded by the Montana Science and Technology Alliance. All six units of the Montana University System are represented in the center with offices at three campuses: the University of Montana, Montana State University and Eastern Montana College. All offices will open to the public this month.

The University System Assisting the State's Business Community

By Kay Lutz-Ritzheimer

Montana Needs Development

Never has the need for economic development in Montana been more acute than at the current time. Historically, the state has been heavily dependent on its basic industries: mining, oil and gas extraction, agriculture, forest products, and tourism. Downturns in several of these industries contributed to the recession in the early 1980s, while mechanization meant the loss of quality jobs. Even though the state's economy has stabilized and forecasts call for slow growth, Montana is expected to lag behind the nation in recovery.

Low per-capita incomes, generally low levels of business and economic activity, and net out-migration experienced in the 1980s all underscore the need for increased business development in the 1990s. To date, Montana's state government has not entered the competitive arena of tax incentives, below-market business loans, or other relocation incentives to lure businesses to Montana. It is critical, therefore, that Montana support existing and emerging small businesses within the state to close the gap between Montana's growth rate and that of the nation.

SENATE BUSINESS & INDUSTRY
EXHIBIT NO. 3
DATE 2/14/91
BILL NO. SB242

February 13, 1991

Chairman "J.D." Lynch
Committee on Business and Industry
Montana Senate
State Capitol
Helena, MT 59620

Dear Senator Lynch:

I am writing in support of SB 242 which provides a pool of research and development funding to be administered as loans by the Montana Science and Technology Alliance. This legislation provides support for a number of initiatives designed to support economic development in the state.

An initiative with which I am most familiar is the Montana Entrepreneurship Center, an organization designed to make available expertise and information to businesses in the state. The Entrepreneurship Center has the potential to directly impact the state economy by providing business services and technical assistance to business owners/entrepreneurs in addition to identifying entrepreneurial and business development opportunities. In the brief period of its operation, the Montana Entrepreneurship Center has build an automated data base containing information that has been accessed by businesses throughout the state. With three offices located in Missoula, Bozeman, and Billings, the Montana Entrepreneurship Center is organized to provide state-wide assistance.

Since its formal opening last fall, the Center has provided help to a wide spectrum of businesses. The funding provisions contained in SB 242 will make it possible for the Montana Entrepreneurship Center to continue to support the small business sector of the state in ways that will promote growth.

Sincerely,

Andre Corbeau

SENATE BUSINESS & INDUSTRY
EXHIBIT NO. 4
DATE 2/14/91
BILL NO. SB242

Testimony of Jon Marchi
As a Proponent with Amendments
Senate Bill 242 - Science and Technology
52nd Legislative Session
State of Montana
Business and Industry Committee
10:00 A.M. February 14, 1991

Mr. Chairman,

Members of the Committee, for the record my name is Jon Marchi. In my testimony today I represent myself and The Montana Private Capital Network as a Director and Officier.

I have been involved with State economic development efforts for the past ten years (five legislative sessions). My background is private sector although I have served and continue to serve on State and local boards. In addition, I serve on several corporate boards throughout Montana. Up until January 1991, I served on the Montana Science and Technology Development Board for the past six years which has been from the inception of the program.

I am testifying in favor of Senate Bill 242 with certain amendments. Having served on the Science and Technology Legislative Committee that drafted this bill, I am familiar with it although certain parts of the bill were later changed.

Please consider the following facts in support of funding an additional $5,100,000 for research and development projects for the Science and Technology Alliance:

Over the past six years Science and Tech has made 31 research and development investments representing total funds disbursed of $2,357,144 with additional funds committed but not disbursed of $318,878 for a total of $2,676,022. This equates to an average research and development investment of $86,323. The largest research and development investment to date ($350,000) was for Western Energy's coal drying process. The smallest was for $5500 for a business incubator project in Butte.

Total cash return on these research and development investments to date has been $3975. or less than 2/10's of 1.0%. The average life is now about three years. On the more positive side, total matching funds from all other non State sources exceed $78,500,000 for a respectable 29 to 1

match ratio. To be fair these match numbers are skewed by two real success stories. The largest research and development investment of $350,000 to Western Energy is now being matched by the Department of Energy with $69,000,000 to build a pilot plant in eastern Montana to de-water and clean up our Montana coal prior to out of state shipment. The second success story is Science and Tech's $50,000 initial investment to help start the Center for Interfacial Engineering in Bozeman which ultimately resulted in a $7,500,000 grant from the National Science Foundation. However, to secure this grant the State must provide matching funds of $1,000,000 of which $600,000 is part of this Senate Bill 242 as presently written.

When you consider this bill it is important that you understand that funding research and development is substantially different than funding seed capital and venture capital investments. In making seed capital loans, the Montana Board of Science and Technology fully anticipates a return of 9% per annum or more plus a return of principal. The Board knows that some of these investments will fail. However, because the debt instrument is convertible to equity the more successful seed capital investments should hopefully more than make up the difference. This cannot be said or implied about research and development investments. Cash return may be low to non existent but other non-cash returns can be very substantial such as a match ratio of 29 to 1; increased employment; increased recognition for the State; and, providing ideas and products that may become in time, good businesses to Montana's benefit.

Kay Lutz-Ritzheimer, Executive Director of the Montana Entrepreneurship Center, is here today to describe a most successful program that has been primarily funded by the Montana Science and Technology Alliance. Although near term cash returns to the Alliance are not anticipated the other returns are already substantial from this Center of Excellence.

Many have called Science and Technology the best economic development program the State has to offer. That may or may not be true. Only time will tell. However, it is incumbent upon me to thank all of you on this committee and all the previous legislators for your support of this program. Two years ago Science and Technology received only three dissenting votes in both houses when the $7,500,000 seed capital fund was established from the In-State Investment Fund portion of the Coal Tax Trust Fund. Approximately, $1,330,750 of that $7,500,000 is invested in four businesses in Montana.

As a previous member of the Science and Technology Board having twenty-five years experience in developing and financing small and medium size businesses in Montana, I respectfully request that you favorably consider the

following amendments to this bill:

Page4, line 7, recommend change to read June 30, 1994 to be consistent with seed capital loans and to provide the board more time to make intelligent and informed decisions regarding research and development investments. It has taken two years to invest $1,330,750 of the $7,500,000 seed capital fund or 18% of the total.

Page 4, line 17, recommend change to $1,000,000 from $600,000. The State must provide a total match of $1,000,000 to secure the $7,500,000 of National Science Foundation funds for the Center for Interfacial Process Engineering over the next few years. Let us provide all that funding in this legislation so that it is not necessary to return to this committee two years from now.

Thank you.

Jon Marchi
7783 Valley View Road
Polson, MT 59860
883-5470

TESTIMONY OF
KAY LUTZ-RITZHEIMER, EXECUTIVE DIRECTOR
MONTANA ENTREPRENEURSHIP CENTER

SENATE BUSINESS & INDUSTRY
EXHIBIT NO. 5
DATE 2/14/91
BILL NO. SB 242

Before the Senate Standing Committee
for
Business and Industry
State of Montana

Testimony for Senate Bill 242
February 14, 1991

This testimony is offered in support of Senate Bill 242 which allocates in-state investment funds to be used for research and development projects in the form of loans provided through the Montana Science and Technology Alliance to the Centers of Excellence program and the Montana Entrepreneurship Center.

The Montana Entrepreneurship Center is the cooperative effort of the University of Montana, Montana State University and Eastern Montana College and uses the strengths of all six units of the Montana University System to address business development and economic diversification by creating the infrastructure necessary to encourage and support entrepreneurship.

With a central office in Missoula and regional offices in Bozeman and Billings, the Center provides business and technical assistance to entrepreneurs, inventors and small-business owners statewide. While every client that accesses the Center receives the assistance required, Center directors at each location identify ventures with the potential to create jobs and impact the economy, and provide intense "hands on" services to these businesses to help insure the probability of their success.

Using a database of public, private and university-sector resources, the Center acts as an information broker, linking clients with information, expertise and facilities needed to make their ventures operational. The Center also promotes networking among entrepreneurs and links clients to sources of funding for start-up, operation, research and development.

In many cases, the Center works closely with the Alliance, directing clients to the seed capital funding program, and with other funding and business incubator programs across Montana. The Center has been welcomed by other public agencies and economic development groups as a key player with the strategic position of gateway to the university system and its resources.

In its second biennium, the Center will sponsor research to identify business and entrepreneurial opportunities and will help sponsor applied research within Montana's universities specific to business issues and product development. Our universities are the seat of research and technological development and must be used to help Montana keep pace with rapidly changing technology.

As new products and technologies are developed within our universities, the Center will help facilitate the transfer of that technology to the private sector by matching research products with the required entrepreneurial skills and capital found in the private sector.

Funding to date:

In 1988, the Montana Science and Technology Alliance provided a $100,000 grant to research, design and establish the Center. In 1989, the Alliance allocated $150,000 in loan funds to provide operating capital for the first biennium. These funds were matched with non-state appropriated funds to include grant funds from the U S WEST Foundation and Atlantic Richfield Corporation.

Clients served to date:

Demand for services has been strong since the Center opened on October 30, 1990. Exhibit A provides a breakdown of clients served for the first three months of operation (November 1, 1990 through January 31, 1991). Directors at the Center's three locations have worked with 131 clients or community groups in scheduled "in-depth" sessions and assisted another 200 clients in "brief" sessions. During this same period, Center staff made over 90 contacts on behalf of clients to connect them with information, resources and expertise in the public, private and university sectors.

The Center has provided assistance to new and developing businesses in all industries with a wide range of management and technology problems. Clients are pleased with the services received, impressed with the outstanding quality of the program, and appreciate the opportunity to access the university system and its vast resources.

The clientele served by the Center is equally impressive. Exhibit B provides client profiles to demonstrate the types of businesses being served by the Center. Immediately following my testimony, our Bozeman Director, Ann Keenan, will discuss two specific cases in greater depth to give you a feeling for the comprehensive nature of services provided at each location.

Senate Bill 242:

Senate Bill 242 is critical to the Center's future and on behalf of the Center's board of governors, I ask this committee to support this important legislation. Section 3, Part (2) of SB 242 designates $3.5 million for loans relating to the Centers of Excellence program and the Montana Entrepreneurship Center. This loan funding is absolutely critical to the Entrepreneurship Center and its continued operation. While the Center will persist with raising funds from private foundations and corporations, most private sources target specific research projects and are reluctant to provide ongoing funds for program operation. Funding provided through this MSTA program is therefore the life blood of the Center's funding base.

Closing comments:

The Montana Entrepreneurship Center wishes to express its appreciation for the support received from the Montana Science and Technology Alliance over the past two and one half years. Without the Alliance, this wonderful and very timely program would not exist. Working together we have developed a very high-quality program, providing an invaluable service to inventors, entrepreneurs and small business owners across the state.

Demand for center services is strong and our success to date has been phenomenal! We are truly developing a model for using one of the state's most valuable resources, its university system, to address business development and economic diversification...a model that is being watched by other states throughout the nation.

We urge this committee to support the Montana Science and Technology Alliance through Senate Bill 242. We have established an outstanding Center of Excellence program with the Montana Entrepreneurship Center. Please help us to continue serving the state's business community.

Thank you.

EXHIBIT A
MONTANA ENTREPRENEURSHIP CENTER

SUMMARY OF CLIENT AND COMMUNITY GROUP SESSIONS
SUMMARY OF NETWORKING CALLS AND MEETINGS

	November 1990	December 1990	January 1991	Total
CLIENT SESSIONS:				
A) "IN-DEPTH" sessions: (Require an average of 3 to 4 hours staff time)				
1) Clients/Client groups	62	19	33	114
2) Community groups	3	4	10	17
TOTAL IN-DEPTH SESSIONS	65	23	43	131
B) "BRIEF" sessions: (Require less than 1 hour staff time)				
1) Requesting information specific to business	27	21	35	83
2) Requesting information about the Center/services	53	30	34	117
TOTAL "BRIEF" SESSIONS	80	51	69	200
TOTAL CLIENT SESSIONS	145	74	112	331
NETWORKING calls/meetings on behalf of clients	38	30	22	90
TOTAL CLIENT-RELATED CONTACTS, SESSIONS AND NETWORK CONTACTS	183	104	134	421

EXHIBIT B
SELECTED CLIENT PROFILES

Case 1 Coffee Row, a new business in Southgate Mall, Missoula, has exceeded all expectations in its first eight months of operation. Its owner would like to expand to more locations in western Montana to include Hamilton and Kalispell. The Center helped this client investigate financing options, evaluate the company's structure, refine a business plan and formulate a marketing strategy.

Case 2 A client group in western Montana is developing new technology for an innovative information system to be used in our national park system. This group would like to keep all research and manufacturing for this project within the state of Montana. The Center linked this client to the Montana Science and Technology Alliance and outlined other options for obtaining research and start-up funds.

Case 3 An inventor requested assistance in patenting a logging system that could significantly impact the timber industry. The Center linked the client with the Innovation Center at Washington State University for expert evaluation of the project and to the U.S. Patent Depository Library at Montana Tech in Butte.

Case 4 In another case, a business owner in Kalispell produces and successfully wholesales a cheese product and wants to expand the business to a full retail operation. This entrepreneur requested assistance with a market feasibility study to evaluate demand and forecast revenues for the new venture. A database search provided the names and backgrounds of sixteen university faculty qualified to provide the market research expertise needed.

Case 5 A Whitefish client requested assistance in locating a marketing consultant with medical sales experience to structure a nationwide distribution strategy for a new physical therapy product. A database search provided the names of several faculty members with the experience required for this project.

Case 6 A community group from the Bitterroot Valley is investigating the feasibility of establishing an industrial park. This group requested assistance in outlining a plan to study the concept. In addition to linking this group with resources to research the project, the Center is helping to arrange an intern from the graduate program in city planning.

Case 7 A group of thirty consultants with expertise in soil and water conservation is forming a new firm to provide consulting services for environmental impact studies. This group requested assistance in developing a marketing strategy, a quality control program and a strategic plan. As is the case with many clients who visit the Center, this group also entered the Center's database as a private sector business that can provide valuable services to other Montana companies.

THE MONTANA ENTREPRENEURSHIP CENTER

Central Office:	University of Montana	(406)243-4009
Regional Office:	Montana State University	(406)994-2024
	Eastern Montana College	(406)657-2813

The Montana Entrepreneurship Center is the cooperative effort of the University of Montana, Montana State University, and Eastern Montana College and is funded by the Montana Science and Technology Alliance. The center uses the strengths of Montana's university system to address business development and economic diversification by creating the infrastructure necessary to encourage and support entrepreneurship.

The center opened in October to offer services to the business community. Directors in Missoula, Bozeman, and Billings use a comprehensive database of public and university resources to link business owners and entrepreneurs with the information, expertise, and facilities they need to make their ventures operational. Directors identify ventures with potential to create jobs and impact the economy and work closely with these management teams to increase the probability of success.

Future plans for the center include providing business information through conferences, newsletters, and electronic bulletin boards. Serving as the central information source for the state, the center will also access other databases and maintain a calendar of conferences, seminars, and business activities scheduled statewide.

In addition, the center will encourage and promote networking among entrepreneurs by maintaining a statewide computer conferencing system. The conferencing system will link Montana businesses to national and international systems to bring information and expertise to the state in areas where experience is lacking. This will help create the infrastructure necessary to support entrepreneurship and business development.

The center will also sponsor research within Montana's universities and technical schools to develop new products, concepts, and technologies and then transfer that technology to the marketplace by matching research products with the required entrepreneurial skills and capital found in the private sector.

Finally, the center plans to monitor the changing needs of business owners and entrepreneurs and use that information to adjust and develop client services. Faculty and center staff will conduct research to identify entrepreneurial and business opportunities and disseminate the results to the business community.

Private funding is provided by U S WEST Foundation and Atlantic Richfield Corporation.

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Volume 28, number 3 Autumn 1990

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SENATE BUSINESS & INDUSTRY
EXHIBIT NO. 6
DATE 2/14/91
BILL NO. SB 242

Testimony of
Ann P. Keenan, Bozeman Director
Montana Entrepreneurship Center, Montana State University
For Business & Industry

SENATE BILL 242

February 14, 1991

Now that you have the basic information regarding the mission, administration and operation of the Montana Entrepreneurship Center. I will report on two Center clients with the potential to significantly impact Montana's economy.

Both clients have been receiving intense hands-on services from the Bozeman office since its opening in October and require on-going assistance in making their ventures operational.

While confidentiality is a critical issue to the Center and its clients, the following have provided the authorization to report on their operations in support of the high quality services they have received.

The first client, Paul O'Leary from Ohio, contacted the Center requesting market research and demand analysis to determine the feasibility of establishing a micro-brewery in Gallatin county. The Center assisted Mr. O'Leary in identifying marketing professors who would be interested in the project. In addition, the Center provided information on other resources of potential value to his operation, including those provided by the University Technical Assistance Program, SCORE and the MSU Marketing Club. After receiving the Center's information, he made arrangements with the MSU Marketing Club to conduct primary market research which was completed in January.

As a direct result of the research conducted, he and his wife plan to move from Dayton to open a micro-brewery in the Bozeman area by winter 1991.

His operation's initial capacity of 1250 barrels per year is expected to yield a gross income of $190,000. During the first year of operation, the business will employ two full-time employees. Projections indicate the number of employees to double within four years and production to triple by the end of the fifth year. Initial distribution will be limited to the Gallatin valley while planning for eventual statewide distribution.

He is currently selling stock to fund his recently incorporated venture and will apply for a small business loan to finance the remaining balance. The Center is currently forwarding information on state and private loan programs.

The second client, Earl Skogley, Professor of Soil Science at Montana State University, has received funding from the Montana Science and Technology Alliance for conducting research in the development of new methodologies in modernizing soil testing. The commercialization of his new technology, the resin capsule, could result in a multi-million dollar manufacturing operation and distribution center.

Dr. Skogley, as a Center client, has received assistance in patenting his invention, studying its market potential and listing the invention on a worldwide database of licensable technology. Before he can properly develop the commercialization of this new technology, he states "We will need much more support from this Center... [and] I can state that MSTA support has been absolutely critical to our current stage of progress."

These clients are representative of the numerous clients who have expressed sincere appreciation for the services received from the Center. The job creation and economic impact of these ventures demonstrate the value of the Center's services in promoting business development in Montana.

Chairman Lynch - member of the Committee - Sen Crippen

My Name is Mayor Richard Larsen. Billings

SENATE BUSINESS & INDUSTRY
EXHIBIT NO. 7
DATE 2/14/91
BILL NO. SB 242

TESTIMONY ON BEHALF OF SB. 242

I stand here today to speak on behalf of SB. 242 and its basic aims in providing funding through the Montana Board of Science and Technology Development for an "in state investment fund for research and development projects."

I have been an active proponent for the use of our vision in developing our future. One of the key areas that have been neglected in Montana for far too long ~~is~~ are the concepts of VALUE ADDED TO OUR RESOURCES. Now most of us have used this term in the adding of value to our agricultural/minerals/or timber resources. However we have not extended our thought processes in adding value to some of our most important resources, OUR PEOPLE, YOUTH AND EXISTING BUSINESSES.

We certainly have not utilized this thought process in considering the development of our service industries.

I am not talking about 3.85/hr service provider

Let me explain. Currently in Billings, we have a Medical Complex that is unparalleled in the Region from Rochester Mn to Seattle North of Denver and Salt Lake City. This is truly a service industry. What can we do to expand this by adding Value. We can visualize the expansion of Medical Related activities ~~of~~ in the product manufacture of goods used in the complex; we can visualize the expansion of Psychiatric, Drug/ ~~and~~ Alcohol and Mental Health programs to service an even wider range of clients and bring them to Montana; we can get into the areas of geriatrics where the potential for expansion of these services is unlimited. The spectrum of medical facility research is limitless.

New concepts must be developed

Retirement Homes
Nursing Complexes

We then are adding value to our resources.

We need not apologize for this direction

If we took this same thought and applied it to other service oriented industries, we can add value to our states economy in areas not even tapped. Think ~~for a minute~~ of the potential Millions of Dollars from outside the State of Montana that will then be brought into our State through value added processes in currently unexplored arenas.

With your consideration of funding a Research and Development component to the Montana Science and Technology Development range of services, I believe we are then beginning at this level to visualize the potentials available and not be limited by our current perspectives for the future. Educational medical etc must be considered

I encourage your favorable consideration of SB 242 to establish funding for Research and Development and I endorse specifically ~~to~~ the component of $1 Million for medical facility research development project loans. You see, As Research generally & Medical Research is developed, the product of that Research becomes the benefit to our communities throughout the State of Montana. We are truly investing in the future of Montana.

We are expanding our ~~vision~~ VISION -

Thank You.

We are adding value to our existing assets.

SENATE BUSINESS & INDUSTRY
EXHIBIT NO. 8
DATE 2/14/91
BILL NO SB242

STATEMENT ON BEHALF OF "RESEARCH AND DEVELOPMENT FUNDING", SB 242

by Jay F. Kirkpatrick, Ph.D., Vice President, Board of Directors, Deaconess Research Institute; Associate Professor of Physiology, Department of Biological Sciences, Eastern Montana College

The need for a first-rate biomedical research institute in Montana can be justified on economic, medical, and educational grounds. The benefits of such an institute include (1) placing Montana in a leadership position to seek answers to the growing problems of rural and gerontological medicine, both of which are demographic realities in our state, (2) providing an attraction for research scientists throughout the U.S. who, if given the opportunity, would pursue their professions in the quality environment of the state, (3) providing jobs for our college graduates in technology and science, (4) bringing substantial federal and private foundation grant monies to the state, and (5) providing the scientific and technical research base which attracts clean industry. While the placement of the Super Collider by DOE and the ultimate location of U.S. West's new research facility was ultimately decided on political grounds, their respective evaluations of Montana during the search process were enlightening, if not encouraging. In short, the state was unable to provide the scientific research support system that facilities and industries of their nature required. Neither the University System nor private facilities could deliver the needed research support. The impressive clean industry and tecnhology which has grown up around the Boston Beltway and the Silicone Valley had far less to do with tax climates than with the scientific support provided by the MITs, the Harvards, the Stanfords and the Cal Techs.

My colleagues here today have eloquently addressed these reasons for supporting a first-rate biomedical research institute. I wish to focus on the educational dimension of a research institute. The United States is currently facing a crisis with regard to the education of scientists. Studies by the National Academy of Science(NAS), the National Research Council (NRC), the National Science Foundation (NSF), the American Association for the Advancement of Science (AAAS), and the American Council on Education (ACE) have all indicated that the U.S. is rapidly becoming one of the most scientifically illiterate countries in the world. The

predictions about the effects of this trend, upon the national economy and defense are dire and supported by recent events.

While much of the problem can be attributed to problems of pre-college education, post-secondary education must shoulder its fair-share of the blame. We are simply not producing adequate numbers of high quality scientists in our colleges and universities. In an attempt to find the causes and seek solutions to this frightening course of events, the NAS and the NSF commissioned a number of studies. One of the results was extremely illuminating. It was discovered that fully one-third of all American students earning the Ph.D. in a scientific (mathematics included) field, first earned their bachelors degrees in a mere 50 undergraduate schools (out of over 2,500 colleges and universities and none of which were in Montana). This report (now known as the Oberlin Report) sought reasons for the success in these small private liberal arts colleges. The two characteristics which set them apart from the less successful schools were (1) their faculty were all heavily involved in research, and (2) their ***undergraduate*** students were all heavily involved in this research. In short, exposure to and involvement in research, at the undergraduate level was seen as the major factor in success.

In response to this, the NSF has redirected virtually all of its undergraduate science education programs to bringing undergraduate students in the sciences into direct contact with research efforts. These programs include (1) Research in Undergraduate Institutions (RUI), in which the primary objectives are to "...strengthen the research environment in academic departments that are oriented primarily toward undergraduate education, ***and promote the integration of research and education at predominantly undergraduate institutions,*** " (2) Research Experience for Undergraduates (REU), which states, "There is wide-spread agreement that active research experience is one of the most effective techniques for training undergraduates for careers in mathematics, science and engineering, ***and that too few such experiences are now available,***" and (3) Instrumentation and Laboratory Improvement (ILI), in which the very first selection criterion is ***"...the proposer's recent science , mathematics, or engineering research performance."*** Finally, a recent editorial in Science (Vol. 251:249, 1991) entitled Teaching and Research, states that ***"Those who say we can separate teaching and research simply do not understand the system..."***.

The Montana University System cannot deliver the research experiences required to produce competent scientists and the current economic plight of the state and the attitude of the legislature toward higher education preclude rectifying this situation. At Eastern Montana College, the various science departments cannot even qualify for most of the NSF grants because of the inability to demonstrate "institutional commitment" through adequate budgets for the sciences, and the same is true for Rocky Mountain College. Thus there is little liklihood of providing the research setting for good undergraduate education in the sciences. Research institutes of the type we are testifying on behalf of today, provide alternate opportunities for exposing undergraduates to research. Indeed, Deaconess Research Institute already involves a substantial number of undergraduates and medical students in the ongoing research. The nuture and growth of independent research institutes, such as DRI, can provide a vital education component to the state's ability to produce competitive scientists.

Testimony Offered in Support of
Senate Bill No. 242
February 14, 1991

SENATE BUSINESS & INDUSTRY
EXHIBIT NO. 9
DATE 2/14/91
BILL NO. SB 242

Richard C. Potter, Ph.D.
Vice-President, Research & Development
Basic Bio Systems, Inc.
2837 Fort Missoula Road
Missoula, Montana 59801
Telephone: 728-0260

I appreciate the opportunity to appear before you today and offer remarks in support of Senate Bill 242.

First, I would like to mention that I serve on the Board of Governors for the Center of Excellence in Biotechnology and, second, my company has received seed funding from MSTA. Accordingly, I am not without bias. Further, since my profession is research and development, I have a natural tendency to support things which advance the cause of R&D.

Having said that, I would like to describe to you, as objectively as I can, what it is like for a small research company to do business in Montana. To give you a quick perspective, I would point out that Basic Bio Systems began life in California. It evolved to a split operation, with a business office in California and a laboratory in Montana. More recently, the company has consolidated entirely into Montana.

There are a number of factors which account for this migration. These include:

1) MSTA: The Sci-Tech Alliance has provided us with badly needed capital. The single downside to doing business in Montana is that we are outside the mainstream of venture financing — MSTA offsets this disadvantage by allowing a company such as ours to buy the time required to access conventional financing sources. Moreover, they have opened many doors and made many useful introductions on our behalf. I should also mention that MSTA has representation on our board of directors and I can, without reservation, assert that they have consistently been among the most positive forces on our board.

2) Biotech Center of Excellence: The Center has arranged ready access to University facilities for our staff. This includes scientific equipment which is simply beyond the means of most small companies — and yet which is vital to the conduct of successful research. Since we are located in Missoula, much of this has involved the University of Montana. However, the Center has also facilitated access to Montana Tech and MSU.

Both of these institutions, MSTA and the Center of Excellence, are largely creatures of this legislature. Speaking for Basic Bio Systems, I would like to say that we are very grateful for what the legislature has done. These institutions genuinely work and are invaluable to a small company such as ours. Indeed, with their help, we hope to ultimately become a large company. I believe that your foresight in establishing them will reap substantial rewards for the economy and stature of Montana.

There are other reasons why our company is in Montana, including the oft-recited ones of quality of workforce and quality of life. Of particular importance to us is that the cost of doing research here is much lower than the norm.

All of these positive considerations can be attractive to other companies — provided there is an effective means of delivering the message. As an illustration, the past president of our company is now heading up another biotech company in California — and this company is actively exploring the establishment of research facilities in Montana. Given success, they also contemplate a warehousing and distribution center here. In this case, the Montana message has been delivered serendipitously. There are elements of SB 242 which, by strengthening MSTA and the Centers of Excellence, will reduce the reliance on serendipity and significantly enhance our ability to deliver the message.

Richard C. Potter

CENTER FOR INTERFACIAL MICROBIAL PROCESS ENGINEERING

SENATE BUSINESS & INDUSTRY
EXHIBIT NO. 10
DATE 2/14/91
BILL NO. SB 247

THE CASE FOR STATE SUPPORT FOR THE

ENGINEERING RESEARCH CENTER

1. In April, 1990, the National Science Foundation awarded Montana State University a grant of $7.4 million, payable over five years, to create the national Engineering Research Center for Interfacial Microbial Process Engineering. The National Science Foundation made this award in part dependent upon a commitment made by Governor Stephens in June, 1989 of State support in the amount of $1 million to the Center over this same five year period. The award creating the Center is the largest such award ever received by the Montana University System.

2. Other support for the Center comes from Industrial Associates of the Center, and amounts to an anticipated $3 million + over the period. Additional support from other sources should exceed another $3 million over the period.

3. The Center presently supports the education and training of over twenty students, and employs over twenty-five faculty and staff.

4. The Center has an international reputation in its specialty, and has brought about a close collaboration with the Idaho National Engineering Laboratory, which is bringing additional support into the state.

5. The technologies being developed at the Center have direct applicability to Montana problems and opportunities, including bioremediation of contaminated soils, and bioleaching of metallic ores.

6. The Center's direct contribution to the state's economy over the period of the award shall amount to well over $14 million, not even counting a multiplier! This is dependent upon the State of Montana's honoring its $1 million commitment. This fourteen-to-one leveraging of state money is significant to the State of Montana in general, and higher education in the state in particular.

2/91

A National Science Foundation
Engineering Research Center
in partnership with the
Idaho National Engineering
Laboratory

Montana State University
College of Engineering
409 Cobleigh Hall
Bozeman, Montana
59717-0398

Telephone: 406-994-4770
FAX: 406-994-6098
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INTERNET: uiperc@terra.oscs.
montana.edu

Deaconess Research Institute, Inc.

SENATE BUSINESS & INDUSTRY
EXHIBIT NO. 11
DATE 2/14/91
BILL NO. SB 242

need to Senate committee

Chairman, Members of the Committee Support S.B. - 242

February 11, 1991

Dear : Senators

As you know, Billings has achieved some eminence in the state as a medical center; we are at a key point to be able to expand the services offered to the patients of the State of Montana by developing and enhancing a research project for our state.

To meet this goal will require active support and participation from the legislature. We have in place an active research program that is ready to be expanded and wants only commitment, both personal and financial, from our state. The benefits to our state are immense. The most obvious to all of us is the additional 100 jobs we will create as we expand our Institute. These 100 jobs will be in the highly technical and scientific area, again improving the reputation of Montana nationally by virtue of quality research, and making it clear to other technologically oriented companies and industries that we have the ability to support these endeavors.

There are many positive spin-offs from research activities that impact directly upon patient care and directly upon continuing education for our physician community.

I am in hopes you will support us strongly as we continue our development efforts.

Sincerely,

Robert K. Snider, M.D.
Chairman of the Board and Medical Director,
Deaconess Research Institute

Deaconess Care Corporation

2520 17th Street West
Suite B-3
Billings, Montana 59102

Telephone 406-255-8470

John M. Jurist, Ph.D./Scientific Director
Robert K. Snider, M.D./Medical Director

SENATE BUSINESS & INDUSTRY
EXHIBIT NO. 11A
DATE 2/14/91
BILL NO. SB 247

Deaconess Research Institute For Geriatric Studies

Accomplishments To Date

Basic Research Projects

- Bone Dynamic Characteristics

Clinical Research Projects

- Osteoporosis
5 • Stress Thermography
- Low Back Pain
- Fracture Healing
- Artificial Intelligence in Medical Diagnosis

Community Education and Outreach

- Billings Regional Science Fair – 2
- Student Training - RMC + EMC
have been • Professional Resource to Academic and Medical Community

Community Impact of existing program is:

- Seven Employees
- Annual Budget: $280,000

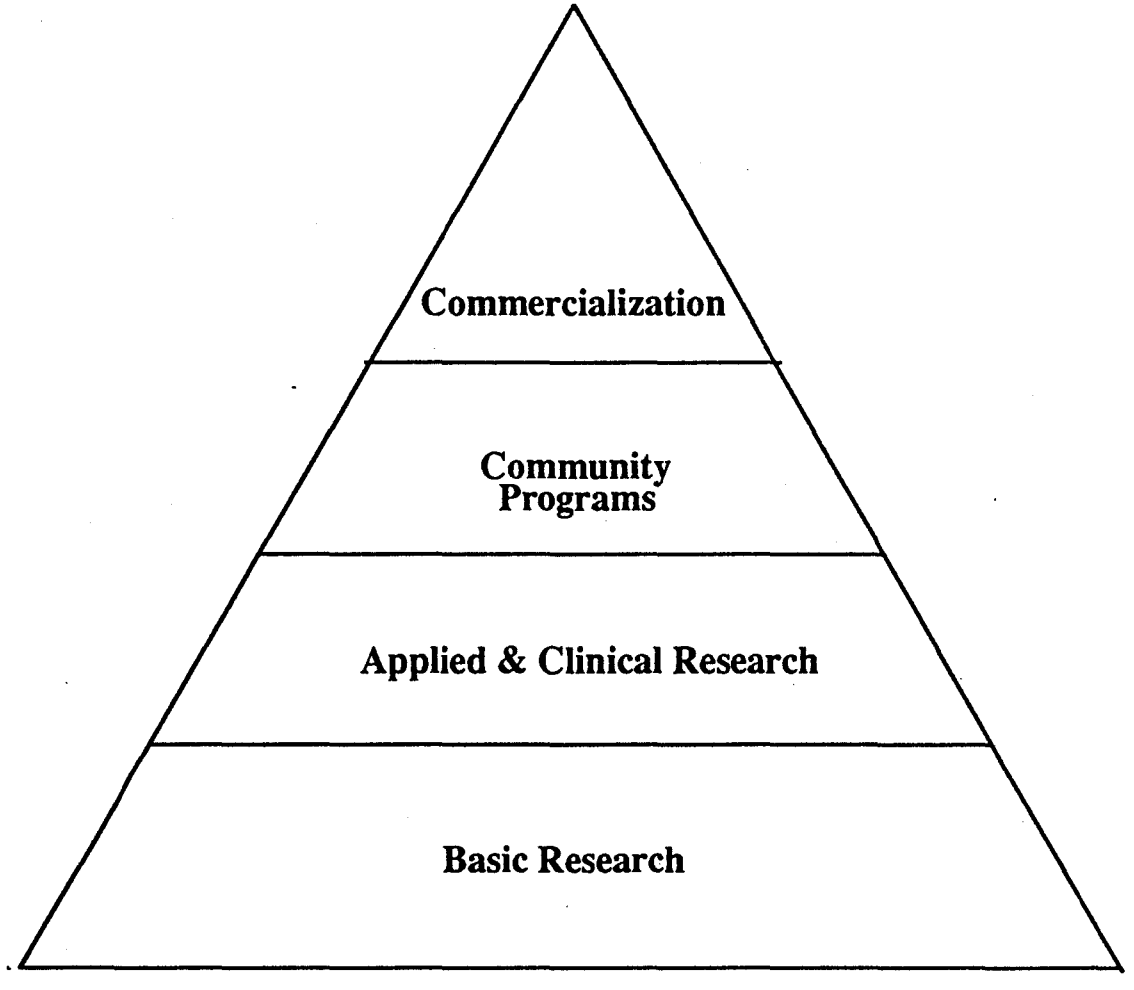
Board decision one month ago - build a world class bio medical research center in Billings, Montana

Mission Statement

- **Conduct World Class Biomedical Research into Health Conditions Related to the Human Aging Process**

- **Have Substantive Impact on the Scientific and Economic Development of the Billings Area and the State of Montana**

Proposed Research Structure



Personnel

Research Scientists	**10 - 12**
• **Basic** research	**4 - 6**
• **Applied/Clinical** research	**4 - 6**
Technicians & Support Staff	**70 - 80**
Administrative Staff	**15**
Total	**95 - 100** new

high skilled, high pay jobs

Development Costs

- **$750,000 - $1,000,000 Per Year for 5 Years**
- **Expected to be Generated From Combination of Federal, State, Local and Private Sources**

What are

the Community Impacts

of this new program?

Annual Budget

- $10 Million Per Year
- 85 - 90 % from Grant Support
- 10 - 15 % from Other Sources

Economic Benefits

high paying, high skilled

- 100 New Jobs

- $10 Million Per Year in Outside Funding

will
- Stimulate Biotechnology and Biomedical Business Development in Billings Area with Commercial spin offs.

should
- Enhance Image and Reputation of Billings Medical Community

1. In addition, I believe this bill will strengthen the Entrepreneurial center located at EMC.
2. I support the matching of funds on a 1 to 1 basis as called for in the bill. of these funds
3. I also support the repayment by recipients. The state will get a payback for its investment in this bill.
4. I strongly urge your support of this bill as an economic development bill for the state of Montana.

thank you

MONTANA TECH

Butte, Montana 59701
(406) 496-4101

ADVANCED MINERALS AND HAZARDOUS WASTE PROCESSING CENTER OF EXCELLENCE

February 12, 1991

SENATE BUSINESS & INDUSTRY
EXHIBIT NO. 12
DATE 2/14/91
BILL NO. SB242

Chairman "J.D." Lynch
Committee on Business and Industry
Montana Senate
State Capitol
Helena, MT 59620

RE: Support of SB 242, Funding for R&D

Dear Senator Lynch:

I would like to provide testimony in support of SB 242, Funding for R&D in Montana. As the newly elected director of the Center of Excellence for Advanced Minerals and Hazardous Waste Processing, I have been impressed with the research conducted under Montana Science and Technology Alliance (MSTA) funding. Our Center, established in 1989, has funded six research projects, at a direct cost to MSTA of $58,000, with matching funds of $190,000. In addition to these Center-funded projects, four additional projects have been pursued and won through the Center with the expenditure of no additional MSTA research funds. The total value of these additional research projects is in excess of $300,000. MSTA dollars committed, including those for establishment and administration of the Center, total $178,000 with outside funds totaling $578,000 for that same period of time. None of these projects have yet generated revenue to repay MSTA loans, but comparison of funds expended vs matching funds certainly would indicate reasonable willingness on the part of outside sources to support Montana-based research. I personally am very enthusiastic about the results of several of these programs, and feel revenue will be generated in the future. A summary of the funding of Center-sponsored research is attached as Table 1.

As a recent fugitive from industry, I strongly support the provision of the bill which requires review of the University System's intellectual property management. An aggressive approach to management of proprietary and patentable resources is absolutely essential to a profitable Montana technological industry. I don't know how many times I have had employees tell me "This idea can't be patentable," and then, after encouragement, to have them pursue and obtain a patent on the idea for them and their company. Successful exploitation of intellectual property takes a different mindset, (and bright, and well-paid patent attorneys) but is worth it in the long haul. In today's competitive environment, intellectual property can provide an income stream and trading stock during negotiations.

TABLE 1

SUMMARY OF ADVANCE MINERALS AND HAZARDOUS WASTE PROCESSING CENTER OF EXCELLENCE RESEARCH AND DEVELOPMENT PROJECTS

PROJECT	MSTA Funds	Outside Funds
Biosorption of Metallic Ions from Dilute Mineral Waste Water Using Filamentous Fungi	9,200	33,000
The Concentrate Tub, a New Concept in Gravity Concentration	6,750	6,750
Evaluating Techniques for Treating Water from an Abandoned Open-Pit Mine (The Berkeley Pit)	10,000	83,000
A Study of Biohydrometallurgy Methods Using Arsenopyrite Ore	9,105	0
Detoxification of Acid Mine Drainage from the Berkeley Pit Using Chelation Affinity Chromatography	12,900	22,400
Establishing the Montana Technology Innovation Center	10,000	50,000
Pilot Plant Testing of a New Technology for Recovery of Metal Values and Toxins from Mine Wastes (Air Sparged Hydrocyclone)	0	150,000
Metal Value Recovery from Electromachining Sludge Waste and Chromium Contaminated Soils	0	110,000
Removal of Arsenic from Waste Solutions and Copper Smelter Solid Wastes	0	86,000
Establishing the Northern Rockies Environmental and Waste Technology Educational Partnership (NEWTEP)	0	37,400
TOTAL	**57,955**	**578,550**

SENATE BUSINESS & INDUSTRY
EXHIBIT NO. 13
DATE 2/14/91
BILL NO. SB 242

Testimony on Montana SB 242 to Senate Committee on Business and Industry, February 14, 1991

By Edward A. Dratz, Professor of Chemistry
108 Gaines Hall
Montana State University
Telephone 994-4041

Members of the Senate Committee on Business and Industry, Chairman Lynch, Ladies and Gentleman:

My name is Edward Dratz, I am a Professor of Chemistry at Montana State University, a Board Member of the Montana Center for Excellence in Biotechnology and a principal investigator on one of the National Science Foundation EPSCoR projects.

I am heavily involved in research and teaching in biotechnology. My students and collaborating faculty are hard at work developing new methods to discover drugs and pharmaceuticals that are more specific, more effective and less expensive than the present generation of compounds. I have been at Montana State for four years and was previously on the faculty of the University of California Santa Cruz for 18 years.

I would like to tell you a little about my experiences in the biotechnology research arena in Montana. I would like to tell you why support of scientific research is good business for Montana and why support of scientific research could be even better business in the future. I would also like to tell you why Montana urgently needs matching funds for the NSF EPSCoR program which is one of the components of SB 242 under consideration today.

Chemistry is called the "Central Science" by many and provides methods and analyses for most other areas of science including biotechnology. Modern chemistry requires an infrastructure of powerful and sophisticated analytical instruments that are expensive and that are constantly being improved and upgraded. When I was considering taking a job at MSU I was concerned that the chemical instrumentation was outdated and inadequate. However, I was impressed by the general good quality of the faculty and their willingness to help work on remedying the weakness in the instrumentation.

During the first two years at MSU I was the author, principal investigator or major contributor to a number of Federal and private foundation grants which provided major chemistry research equipment with a value of about $2.5 million dollars. At most $150,000 of this was state match which is a ratio of over 16 out-of-state dollars for each in-state dollar. Pretty good business by any calculation. This equipment also put MSU at the forefront of institutions in the northwest in analytical instrument capability.

Between June 1986 and June 1990 I have also brought in research grants totaling $905,000 direct costs plus about $300,000 in indirect costs for a total of about 1,205,000. This is all new money in Montana and comes from the Federal government, pharmaceutical companies and private foundations from outside of Montana. **Most of these funds are spent to create research jobs and are paid in salaries to people who live, work and pay taxes in Montana.** I am told that there is an economic multiplier effect when new money comes into a community it creates a cyclic wave of beneficial economic activity which generates additional jobs.

The availability of the modern instrumentation and increased research activity has helped to attract additional outstanding scientists to MSU with active research programs and has stimulated scientists who were already present in new, productive directions.

For example, Professor Al Jesaitis was attracted to MSU from Scripts Clinic and Research Foundation in California in early 1989, largely because of possible collaboration with my research group. Montana has not paid Prof. Jesaitis as he has a so called "soft money" appointment and has generated his salary and that of this research group from Federal and foundation research grants. MSU did provide laboratory set up and remodeling funds but these were much more than recovered from indirect costs that he generates.

Prof. Jesaitis has brought in research grant funds totalling about $470,000 in the two years he has been at MSU plus about $160,000 in indirect costs for a total of $630,000 in two years. Again these amounts are new money in Montana and are largely paid out in salaries for research workers who live in Montana and pay taxes in Montana.

If you add the funds Prof. Jesaitis has brought in to the research funds I have brought this totals $1,805,000. If you divide this by the salary that Montana paid to me over the same period ($173,000) you get **a ratio of over ten out-of-state dollars for each in-state dollar** without considering any economic multiplier effect.

This is an scenario which is quite typical for competitive researchers and can be repeated time and time again with some seed money and encouragement from Montana. Each successful research group tends to stimulate other research groups and to bud off young investigators who become self supporting. For example, a young man who came to Montana with me, Erik van Kuijk who is an MD and PhD has recently become a research assistant

professor at MSU and has obtained his own federal research grant for $250,000 direct costs plus about $75,000 in indirect costs for a total of $325,000. A young colleague who came to Montana with Professor Jesaitis, Mark Quinn who is a PhD, recently obtained his own research grant for about $140,000 direct costs and $56,000 in indirect costs for a total of $196,000. And so the multiplication of support goes. Again, this is all new money in Montana and will largely be spent in salaries.

About two years after I came to Montana I had what seemed to be a good idea for a new research approach in an area where I had not worked before. I will tell you how I have been able to leverage rather modest seed support from Montana into very substantial new research support. In addition, this research idea stands a very good chance of leading to the establishment of a new biotechnology company in Montana in the next two years.

In order to generate any significant amount of financial support for research you need to have some initial results, especially if you do not have a track record in a research area or if the proposed work seems risky. **The newly formed Montana Center for Excellence in Biotechnology** provided a $20,000 seed money grant to help me pay personnel to generate initial research results. I was able to team with another MSU researcher, Dr. Jean Starkey in microbiology to obtain a $75,000 grant from the Tobacco Research Council (TRC) for a project to try my new technology on developing a new anticancer drug.

With $6,000 from MCEBT and $20,000 from the TRC we were able to purchase a core biotechnology instrument called a peptide synthesizer which was an essential component needed for the new research approach. This still is the only peptide synthesizer in Montana and has provided state-of-the-art research material for about six research groups to date.

The data we were able to generate supported two years of funding from NSF EPSCoR II for $250,000 for a group including Prof. Starkey, three other principal investigators and myself. EPSCoR is very enthusiastic about our research and found that it got uniformly excellent reviews nationally. Our new research approach promises to provide a new, rapid method to develop a wide range of highly specific new drugs with greatly improved effectiveness and low side effects.

Our group was joined by Prof. Callis in the Chemistry Department and was able to obtain an NIH Biomedical Equipment grant for $152,000 to upgrade our peptide sythesizer to a higher throughput automated model ($35,000) and to provide $117,000 for state-of-the-art minisuper computers and molecular graphics software that was essential for our research.

We need a couple of more years of seed funding before we will be able to greatly leverage our initial results. EPSCoR is established to provide seed money to stimulate just this kind of new research thrust but will support this only if Montana shows more evidence of interest in stimulating research. I believe that EPSCoR will provide three more years of funding of about $500,000 direct+indirect to help us establish this new method, but only if Montana provides the matching funds for scientific infrastructure development that have been requested as part of SB 242.

If we can get our new technology firmly established it should provide a great deal of research support and economic development. Prof. Starkey has just submitted a grant proposal to the National Institutes of Health (NIH) for $300,000 direct plus $120,000 indirect totalling $420,000 to support the work aimed at new anticancer drugs. I am about to submit a grant proposal to NIH for $840,000 direct + indirect to support my lab's efforts to develop the methods. Prof. Jesaitis plans to submit a grant proposal for a similar amount to support this approach applied to developing new anti-arthritis and anti-emphysema drugs.

Prof. Cory has submitted a grant proposal to Proctor and Gamble for $100,000 to support our approach to developing a new drug against AIDS virus. Prof. Cory plans to submit similar grant proposals to NIH. We plan to submit a $300,000 grant to Burroughs Wellcome for support of development of the approach. It may take 1-2 years to get these proposals funded if all goes well. We urgently need continuing seed support from NSF EPSCoR to keep our momentum up as the research and other support matures.

There is a strong likelihood that our new technology will lead to the establishment of an innovative new biotechnology company in Montana. All this is rather impressive leverage for $26,000 seed support provided by the Montana Center for Excellence in Biotechnology (MSTA). All of the seeds planted in scientific research cannot be expected to come up as strongly and vigorously as the one I have described. However, investment in scientific research in Montana and **most particularly, investment in NSF EPSCor matching by Montana is certain to pay off handsomely.**

I hope I have been clear. If you would like any additional information, I have included my telephone number and mailing address on the transcript of my remarks that I have given you. Thank you for your attention.

WITNESS STATEMENT

NAME: Edward Dratz DATE: 2/14/91

ADDRESS: Dept. of Chemistry

PHONE: 994-4041

REPRESENTING WHOM? Montana State University

APPEARING ON WHICH PROPOSAL: SB 242

DO YOU: SUPPORT? X AMEND? _____ OPPOSE? _____

COMMENTS: Prepared Statement ~~enclosed~~ attached.

Matching funds for NSF EPSCOR is crucial for development of scientific research base and for economic development in the knowledge-based economy of the future in Montana. The statement I attach contains some data in support of my position

PLEASE LEAVE ANY PREPARED STATEMENTS WITH THE COMMITTEE SECRETARY.