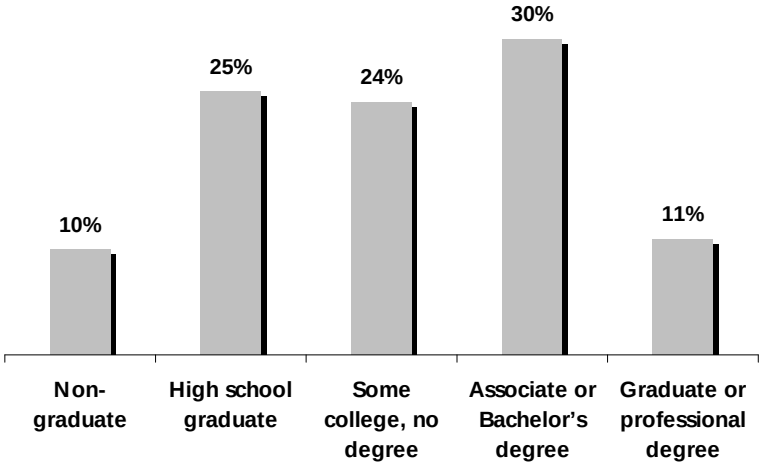
# Bio's Hot! *Profile of Biotechnology in Lincoln*

## Introduction

Biotechnology is one of the most rapidly growing industries in the nation. Biotechnology, as its name implies, combines biology with technology. It refers to scientific work related to genetic engineering for humans, animals and agriculture, the environment, genetic data mining, as well as firms involved in the neurosciences and genome work. The biotechnology cluster includes pharmaceutical manufacturing, medical equipment manufacturing, medical and dental laboratories, and commercial non-physical research.

## Why Lincoln?

While the battle to attain status as a major biotech hub appears to be over, the industry is rapidly expanding and will establish many secondary hubs in the coming years. **Lincoln, a centrally-located community of nearly 240,000, is well positioned to cultivate this industry** through its **highly educated workforce, existing biotech presence, extensive university research** and **outstanding quality of life.**




Lincoln is one of only two metropolitan areas in the nation with **significant concentrations of employment in each of four biosciences fields**: agricultural feedstock and chemical, drugs and pharmaceuticals, medical devices and equipment, and research, testing and medical laboratories.[1]

Lincoln's superior workforce was a key factor in the decision by pharmaceutical giant **Novartis Consumer Health, Inc.** to expand its production portfolio and professional employment in the Lincoln facility. The expansion adds brands such as Excedrin® ES/Migraine™, Comtrex®, Excedrin® PM, Excedrin® Aspirin Free Tension Headache, Excedrin® Sinus, Bufferin® and No-Doz® to the list of products manufactured in Lincoln.

Given the state's massive agricultural complex, it is not surprising that the majority of biotechnology firms in Nebraska produce veterinary and animal products. **Lincoln's strengths in agriculture and animal science make the city a natural fit for biotech firms specializing in**

[1] *Growing The Nation's Biotech Sector: A Regional Perspective*, Battelle Memorial Institute, http://www.bio.org/local/battelle2007/

**these areas.** For example, Pfizer, the world's largest pharmaceutical firm, operates its largest manufacturing site for veterinary pharmaceuticals in Lincoln.

**Lincoln also benefits from the significant biotech presence at the University of Nebraska-Lincoln (UNL).** UNL, designated a top 100 research institution by the National Science Foundation, is the state's only land-grant university and primary research and doctoral-degree granting institution. Areas of excellence include **bioinformatics**, **nanotechnology**, **plant genomics**, and **entrepreneurship** as well as materials research, electronics engineering and testing, and remote sensing technology. A number of local firms have their origins in research conducted at UNL. In addition, UNL graduates hundreds of life sciences and engineering students per year—individuals who are ideal professionals for the biotech industry.

Recent grants awarded to UNL biotech researchers include $10 million from the NIH to develop a **protein used to treat hemophilia B** and $11 million for development of a **vaccine against botulinum neurotoxin**. UNL researchers are developing a **cholesterol-lowering compound** out of beef tallow and soybeans, creating a **nicotine vaccine**, formulating better methods to detect microbial pathogens in processed foods, using new catalysts to strip hydrogen from **alternative fuels**, particularly plant-based alcohols and acids, and delivering **drug-carrying nanoparticles** to treat breast and prostate cancers.[2]

The University of Nebraska-Lincoln's biotech infrastructure includes:

> **UNL Center for Biotechnology** which has produced leading research on genomics, proteomics, and bioinformatics**. The Center** promotes research in all aspects of molecular life sciences leading to improvements in agriculture, health care and the environment. The center is supported by the Nebraska Research Initiative funds allocated through the Center for Biotechnology and by funds from the National Science Foundation (EPSCoR Infrastructure grant). Currently there are 7 core facilities at the Center: Genomics, Structural Biology, Flow Spectrometry, Mass Spectrometry, Plant Transformation, Bioinformatics, and Microscopy. For more information link to: http://www.biotech.unl.edu/
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> The **Nebraska Center for Virology (NCV)** which links researchers at UNL, the University of Nebraska Medical Center, and Creighton University—Nebraska's three major biomedical research institutions. Ongoing NCV research activities address pathogenic and therapeutic questions of **some of the most devastating viral and neuroimmune disorders facing the global community**. NCV scientists are making significant contributions to the study of human, animal and plant viruses including HIV, herpesviruses, human papilloma virus, and the Chlorella viruses as well as neurodegenerative diseases such as Alzheimer's and Parkinson's. For more information link to http://www.unl.edu/virologycenter/overview.html
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> **The Redox Biology Center** (RBC) is a broad-based interdisciplinary and multi-institutional entity involving researchers from the University of Nebraska-Lincoln (UNL) and the University of Nebraska Medical Center in Omaha (UNMC).The specific aims of the Center are to buttress and expand the existing strengths in redox biology in Nebraska by mentoring junior faculty to success, recruiting new faculty with complementary research interests and strategically enhancing the biomedical research structure. For more information link to http://www.unl.edu/RedoxBiologyCenter/
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> The **Plant Sciences Initiative**, an interdisciplinary research and training program in the basic plant sciences. The initiative involves the work of faculty with research strengths in several areas of plant biology research including **plant-microbe interactions, plant signaling and organellar biology, abiotic and biotic stress responses, and genomics/proteomics.** For more information link to: http://psiweb.unl.edu/

[2] UNL Office of Research, http://www.unl.edu/research/news/annuals.shtml

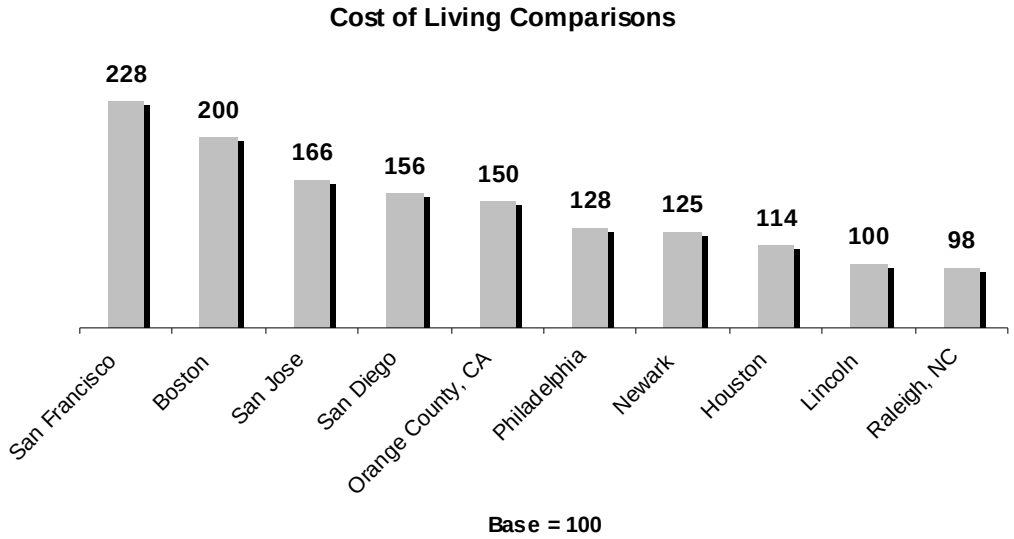
The **University of Nebraska Technology Park** promotes synergy between the University of Nebraska and park tenants by **facilitating technology transfer and interaction with the private sector** via basic and applied research of technology-based projects and services. Permitted activities include laboratories and related facilities intended for basic and applied research, development of technology-based products and services or testing of technology-based products and services as well as facilities intended for production or assembly of products of a technological nature. For more information link to: http://www.unebtechpark.com/

Lincoln is home to **EPSCoR/IDeA** and the **BioNebraska Life Sciences Association**. EPSCoR/IDeA assists Nebraska educational institutions to enhance their science, technology, engineering, mathematics, and **biomedical research**; helps educational infrastructures increase research and development competitiveness; and **fosters economic development through support of technology transfer**. BioNebraska is the trade association for life sciences in the state of Nebraska.

Finally, Lincoln offers the ambiance of a friendly small town and the amenities, attractions and entertainment opportunities of a major metropolitan area. Lincoln is both the **state capital and home to the flagship campus of the University of Nebraska**; as a result it provides a greater range of offerings than might be expected in a community of its size. Efficient transportation, a stable business environment, advanced health care technology and an excellent educational system are just a few of the reasons why **Lincoln ranks highly in livability studies**.

## Cost of Living

Lincoln's cost of living compares favorably with the top biotechnology metro areas nationwide.[3]




[3] ERI Relocation Assessor; individual comparisons

## Lincoln's Biotech Industry

Lincoln's biotech industry includes companies that develop and manufacture **human and animal products**, conduct **research and testing**, produce **instruments and controls**, and provide **specialized industry-related services**. More than 7,000 individuals are employed in the biotech industry in Nebraska. Approximately 2,500 of those individuals are employed in Lincoln.

## Human and Animal Products

***Geneseek***
DNA-based diagnostic products & services
http://www2.geneseek.com/index.sp
Local employment: 13

***MegaBase Research***
Specialty enzymes & immunochemical reagents
http://www.pcrjet.com/about.htm

***Nature Technology***
DNA vector development
http://www.natx.com/
Local employment: 10

***Novartis Consumer Health, Inc.***
Over-the-counter pharmaceuticals including Triaminic, Excedrin, Comtrex and Bufferin
http://www.novartis.com/consumerhealth/index.shtml
Local employment: 600

***Rieke Metals***
Organic chemicals; pharmaceutical research reagents
http://www.riekemetals.com/
Local employment: 10-19

***Marsland Laboratories LLC***
Nutrition for high performance dogs & dogs with Arthritis or Hip Dysplasia
http://www.amaize.com/

***MI Industries***
Dietary products for zoo animals & pets
http://www.naturesvariety.com/
Local employment: 80

***Pfizer, Inc.***
Veterinary pharmaceuticals & biologicals
http://www.pfizer.com/pfizer/main.jsp
Local employment: 500

***Pharma Chemie, Inc.***
Human & companion animal nutritional supplements
http://www.pharma-chemie.com/
Local employment: 20-49

## Specialized Instruments, Controls, Hardware & Software

***Holland Scientific***
Plant canopy sensor specifically designed to measure plant biomass under any illumination condition
http://www.hollandscientific.com/

***Li-Cor Biosciences, Inc.***
Biotech & environmental instruments; DNA sequencers
http://www.licor.com/
Local employment: 200

***Precision Machine Company, Inc.***
Agricultural & animal research lab equipment
http://www.pmcinc.biz/
Local employment: 10-19

***Pure and Secure***
Water purification systems
http://www.purewaterinc.com/
Local employment: 50-99

***Teledyne Isco, Inc.***
Wastewater samplers, water flow measuring equipment, liquid chromatography products
http://www.isco.com/
Local employment: 400

## Specialized Services

***Alpaca Registry***
Nationwide alpaca registry
http://www.alpacaregistry.net/index.sp

***Benchmark Biolabs***
Laboratory services for veterinary vaccine research
http://www.benchmarkbiolabs.com/
Local employment: 10-19

***MDS Pharma***
Contract research for pharmaceutical & biotech industries
http://www.mdsps.com/default.shtml
Local employment: 530

***Pat O'Meara Associates, Inc.***
Statistical analysis & data management for pharmaceutical & medical industries
http://www.patomeara.com/

## Average Annual Salary, Life Sciences Occupations, Lincoln MSA, 2006[4]

| | Annual Salary | | |
|---|---|---|---|
| | **Entry** | **Experience** | **Median** |
| All Life, Physical & Social Science Occupations | **$27,720** | **$57,035** | **$41,905** |
| Agricultural and Food Science Technicians | $24,335 | $35,175 | $31,510 |
| Biochemists and Biophysicists | $37,200 | $67,480 | $53,205 |
| Biological Technicians | $21,355 | $33,105 | $27,535 |
| Chemical Technicians | $27,780 | $42,415 | $39,210 |
| Chemists | $36,030 | $54,660 | $44,840 |
| Conservation Scientists | $43,175 | $75,090 | $65,275 |
| Environmental Science and Protection Technicians | $25,175 | $40,100 | $35,295 |
| Environmental Scientists and Specialists, Including Health | $37,860 | $50,900 | $45,005 |
| Epidemiologists | $45,475 | $70,570 | $58,130 |
| Food Scientists and Technologists | $23,110 | $42,290 | $29,730 |
| Forensic Science Technicians | $23,355 | $42,490 | $33,745 |
| Forest and Conservation Technicians | $17,615 | $31,145 | $25,570 |
| Geoscientists, Except Hydrologists and Geographers | $35,815 | $67,945 | $53,170 |
| Life, Physical, and Social Science Technicians, All Other | $25,950 | $39,855 | $34,905 |
| Microbiologists | $49,035 | $76,270 | $63,710 |
| Soil and Plant Scientists | $34,710 | $74,310 | $53,615 |

[4] Nebraska Workforce Development, Labor Market Information, http://neblswages.nwd.ne.gov/ Sept 2006 ECI Factors