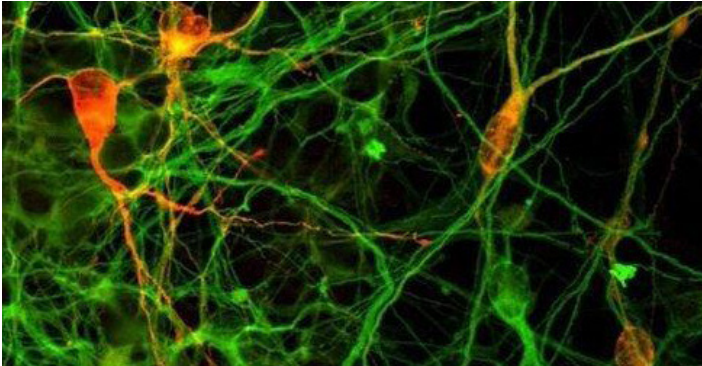


# BOHLANDER STEM CELL RESEARCH LABORATORY

**W**e're performing cutting-edge research on transforming stem cells into functioning neurons, heart cells and cancer-fighting cells. We use a variety of adult stem cells from bone marrow, adipose, umbilical cord and recently induced pluripotent stem cells (iPS) from the WiCell Institute in Madison, Wisconsin. These powerful iPS cells have the ability to differentiate into any cell type in the body. Here is an overview of some of our ongoing state-of-the-art research projects.



BOHLANDER'S STEM CELLS PRODUCING DOPAMINE (ORANGE), COMMONLY MISSING IN PARKINSON'S PATIENTS.

## NanoFiber Technology

We have started experiments using different nano fiber materials produced in our laboratory and the Mechanical Engineering Department at Bradley University. Following transplantation, many stem cells fail to survive and those that do tend to migrate away from the target site. **Nano materials promise to enhance stem cell survival and greatly reduce stem cell migration.** Our experiments have shown with stem cells embedded in a nano fiber matrix grow normally and do not migrate. We have injected stem cells with nano materials into animals to determine the effectiveness in utilizing these materials with stem cells in replacing damaged tissue.

## Neurodegenerative Disease

One major project investigates the potential of using stem cells to replace damaged brain cells found in patients suffering from neurodegenerative diseases such as Parkinson's disease. **We have transformed stem cells into functioning like the brain cells.** We have been able to induce these cells to produce dopamine, a chemical missing in patients with Parkinson's disease. We plan to conduct animal experiments to determine if transplanting stem cells into regions of the brain where this damage has occurred will improve symptoms of the disease. It's an exciting tool and we hope to progress quickly with these cells.

## Parathyroid Disease

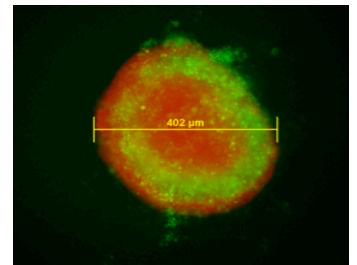
Recently we were the first to transform adult stem cells into parathyroid hormone producing cells. Currently there is no effective treatment for parathyroid disease, parathyroid hormone regulates calcium in the body and is important in normal muscle function including heart muscle. Patients suffering with parathyroid disease must take large amounts of calcium to prevent serious symptoms. **With our success in producing parathyroid hormone secreting cells from stem cells there is hope for a more effective therapy.**

## Cardiac Disease

Using iPS stem cells from the WiCell Institute, the researchers at the Bohlander Laboratory have produced *human beating-heart* cells and *functioning* cardiac pacemaker cells. **Our success with this process will allow us to produce heart muscle cells and pacemaker cells on demand** to investigate the incredible potential of replacing damaged human heart tissue.

## Ovarian Cancer

We are investigating a potential cell-based therapy using a patient's own stem cells for treating ovarian cancer. **We successfully used three laboratory models to show significant migration of stem cells toward ovarian and pancreatic cancer.** Our next objective is to test the efficacy of this cell based therapy in an animal model using genetically engineered stem cells to deliver a factor that converts a systemic pro-drug into a tumor-killing chemotherapy drug.



HEALTHY STEM CELLS (GREEN) MIGRATING TOWARDS OVARIAN CANCER CELLS (RED).

## Meet The Bohlander Research Team

We're excited about team's contributions to stem cell research and welcome your inquiries! Please contact us for more information.

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