

NAME: CHARLEEN T. CHU, MD, PHD
COMPANY: UNIVERSITY OF PITTSBURGH SCHOOL OF MEDICINE
WHAT I DO: RESEARCH (CELL BIOLOGY OF PARKINSON'S DISEASE) AND DIAGNOSTIC PATHOLOGY (EYE AND BRAIN)

QUICK DESCRIPTION:

I LEAD A TEAM OF SCIENTISTS (UNDERGRADUATE STUDENTS, MD AND PHD STUDENTS, POST-DOCTORAL TRAINEES, AND JUNIOR FACULTY) FOCUSED ON UNDERSTANDING WHAT GOES WRONG IN BRAIN CELLS (NEURONS) TO CAUSE PARKINSON'S DISEASES. AS A PHYSICIAN, I ALSO DIAGNOSE DISEASES OF THE EYE AND BRAIN FROM ABNORMAL TISSUES REMOVED DURING SURGERY, ETC.

DESCRIBE YOUR WORK – WHAT YOU DO ON A DAILY BASIS...

AT LAB MEETINGS, I LISTEN TO TEAM MEMBERS DISCUSS THEIR EXPERIMENTS, HELP WITH THE INTERPRETATION OF WHAT THE EXPERIMENTS MEAN, AND WHAT STEPS SHOULD BE TAKEN NEXT TO DISTINGUISH POTENTIAL EXPLANATIONS. THERE IS ALSO A LOT OF TIME SPENT ON THE COMPUTER, WRITING PAPERS ON OUR DISCOVERIES, READING WHAT OTHER GROUPS HAVE FOUND, GIVING SUGGESTIONS TO CRITIQUE AND IMPROVE THE WORK OF OTHER GROUPS (PEER-REVIEW), WRITING PROPOSALS TO GET MONEY TO SUPPORT THE STUDIES. I ALSO SPEND TIME TRAVELING TO SCIENTIFIC MEETINGS AND VISITING OTHER UNIVERSITIES TO DISCUSS THE POTENTIAL IMPORTANCE OF OUR DISCOVERIES FOR UNDERSTANDING AND HOPEFULLY TREATING PARKINSON'S DISEASE.

WHAT DO YOU LIKE TO DO OUTSIDE WORK?

PREPARE AND EAT FOODS FROM AROUND THE WORLD.
OUTDOORS ACTIVITIES LIKE HIKING, BIKING, SKIING, KAYAKING.
READING, OPERA, MUSICALS, SYMPHONY, Pitt BASKETBALL GAMES.
CHOW CHOWS.

HOW/WHEN DID YOU KNOW YOU'D BE A (SCIENTIST) SOMEDAY?

I HAVE ALWAYS BEEN FASCINATED BY THE LIFE CYCLES OF ANIMALS AND PLANTS, COLLECTING SEASHELLS AND ROCKS. BY HIGH SCHOOL, I HAD DEVELOPED A STRONG INTEREST IN HOW THE BRAIN WORKS, THE NATURE OF CONSCIOUSNESS, AND HOW THOUGHTS MIGHT BE ABLE TO INFLUENCE THE IMMUNE SYSTEM. INITIALLY, I WAS INTERESTED IN PHOTOJOURNALISM OR MARINE BIOLOGY, BUT ENDED UP SIDE-TRACKED INTO MEDICINE WHERE I FOUND NEW INTERESTS. I SUPPOSE I NOW STUDY THE LIFE CYCLE OF MITOCHONDRIA WITHIN BRAIN CELLS (NEURONS). THAT IS THE FUN OF SCIENCE – YOU SET OUT DOWN A PATH, THE DATA LEADS YOU FORWARD, AND WHO KNOWS WHAT YOU WILL DISCOVER!

WHAT ARE THE MOST DIFFICULT CHALLENGES OF YOUR WORK?

OBTAINING FUNDING TO SUPPORT THE SCIENTIFIC RESEARCH (SALARIES FOR MY LAB GROUP, SUPPLIES, EQUIPMENT). THE ECONOMY IS VERY TIGHT RIGHT NOW, AND SO MUCH EFFORT IS PLACED IN WRITING GRANT PROPOSALS. SO MANY EXCELLENT PROPOSALS ARE GETTING TURNED DOWN THAT THERE ARE LARGE ELEMENTS OF CHANCE INVOLVED, INSTEAD OF JUST CAREFUL THINKING, HARD WORK AND INSPIRATION.

WHAT ARE YOUR FAVORITE PARTS OF YOUR WORK?

MAKING THAT DISCOVERY OR THAT NOVEL LINKAGE. A LOT OF TIMES, YOU SET UP A HYPOTHESIS TO BE DISPROVEN OR SUPPORTED BY EXPERIMENTATION. THE NATURE OF SCIENCE IS THAT YOU DO NOT KNOW THE OUTCOME. THE MOST REWARDING

MOMENTS ARE WHEN YOU STUDY THE DATA THAT MAY NOT BE WHAT YOU EXPECTED, AND HAVE A MOMENT OF INSPIRATION AS TO WHAT IT CAN MEAN. NEW EXPERIMENTS CAN THEN BE SET UP TO DISTINGUISH THESE POSSIBILITIES AND THEY ULTIMATELY LEAD TO A DEEPER UNDERSTANDING OF A BIOLOGICAL PROCESS AND HOW IT CAN BE DISRUPTED IN DISEASE OR EXPLOITED TO TREAT DISEASES.

HOW DOES MATH AND SCIENCE CHANGE THE WORLD?

WE ALL HAVE OUR BIASES AND INNATE RESPONSES TO SITUATIONS THAT MAY NOT BE LOGICAL. MATH AND SCIENCE GIVE US TOOLS TO SYSTEMATICALLY INVESTIGATE IDEAS AND CONCEPTS, AND TO SHARE THESE INVESTIGATIONS WITH OTHERS. ONE OF THE CENTRAL PRECEPTS IN SCIENCE IS THAT YOU SET UP WAYS TO TRY TO DISPROVE YOUR PET HYPOTHESIS (ANOTHER WAY OF PUTTING IT IS THAT YOU INVESTIGATE ALTERNATIVE EXPLANATIONS AND TRY TO DISPROVE THEM TO SUPPORT YOUR IDEA). THE CONCEPT OF PEER REVIEW IS ALSO IMPORTANT – SCIENTISTS INVITE OTHER SCIENTISTS TO EXAMINE THEIR DATA, THEIR LOGIC IN INTERPRETING THE DATA, AND TO HELP IDENTIFY POTENTIAL CHALLENGES TO THEIR CONCLUSIONS. THIS ALLOWS US ALL TO STRENGTHEN OUR WORK AND TO THINK IN DIFFERENT VIEWPOINTS. WE TRY TO TAKE COMPLEX SYSTEMS AND REDUCE THE VARIABILITY TO ANSWER A SPECIFIC QUESTION. RECONCILING RESULTS THAT AT FIRST APPEARS CONTRADICTORY ALLOWS US TO RE-INTEGRATE THE DATA INTO A LARGER FRAMEWORK THAT MORE CLOSELY APPROACHES THE TRUTH.

HOW ARE YOU CHANGING THE WORLD?

I DON'T KNOW THAT I AM CHANGING THE WORLD, EXCEPT THAT I HOPE THE INDIVIDUALS THAT I CONTACT MAY BE INSPIRED TO PURSUE THEIR PASSIONS, BUT ALSO REMAIN OPEN-MINDED AND CONTENT WITH WHAT THEY HAVE.

WHO WAS YOUR INSPIRATION?

I TAKE BITS AND PIECES FROM DIFFERENT PEOPLE -- THERE IS ACADEMIC/PROFESSIONAL SUCCESS THAT IS FORMALLY RECOGNIZED AND THERE IS ALSO SUCCESS IN BEING ABLE TO ENJOY WHAT YOU DO AND WHO YOU DO IT WITH.

WHAT WAS YOUR FAVORITE SUBJECT IN SCHOOL?

BIOLOGY AND LITERATURE

WHAT ADVICE DO YOU HAVE FOR TEEN GIRLS TODAY?

BELIEVE IN YOURSELF AND SURROUND YOURSELF WITH POSITIVE PEOPLE. I WAS FORTUNATE TO HAVE SOME KEY MENTORS THAT BELIEVED IN MY POTENTIAL AND THIS HELPS ME SUSTAIN MY PRODUCTIVITY DURING DIFFICULT PERIODS. DON'T FORGET TO FOCUS ON YOUR STRENGTHS EVEN WHILE YOU WORK TO IMPROVE IN OTHER AREAS.

DESCRIBE YOURSELF IN ONE WORD...

INTEGRATIVE

HOW CAN WE LEARN MORE ABOUT WHAT YOU DO?

<HTTP://PATH.UPMC.EDU/PERSONNEL/FACULTY/CHU.HTM>