



*"The glory of medicine is that it is constantly moving forward,  
that there is always more to learn."*

— William J. Mayo, M.D.

## Mayo Clinic Amyloidosis Research Update

Spring 2011

### Finding answers, improving lives

Mayo Clinic health care professionals see the needs of their patients every day in hospitals and exam rooms. They take those needs to the laboratory for answers, and then translate discoveries into clinical practice at Mayo and worldwide, bringing new treatments and improved care to patients.

In gratitude for your support of the amyloidosis research program at Mayo Clinic, we are pleased to provide you with this research update. The goal of our basic and clinic research programs is to better understand why people get amyloidosis and to devise better treatments for that disease.

Our basic research program is led by Marina Ramirez-Alvarado, Ph.D., a scientist in biochemistry who is focusing her work on trying to understand why these abnormal proteins produced by plasma cells in the bone marrow "misfold" and deposit themselves in the heart, kidneys, liver, and other organs. Dr. Ramirez-Alvarado published an article last year in the journal *Structure*. She used a combination of techniques including crystallography, nuclear magnetic resonance spectroscopy, and bioinformatics and was able to determine the surface shape of the molecule involved as a result of a mutation. Because of this mutation, an abnormal structure was produced, which led to its deposition as an amyloid protein. This study has helped us better understand why some patients' proteins deposited amyloid and why most other patients' proteins do not.

Morie A. Gertz, M.D., and Angela Dispenzieri, M.D., have been two of our leaders in stem cell transplantation for amyloidosis. In December of 2010, they updated the results with stem cell transplant, demonstrating that this can be a highly effective treatment. Over the years, we have improved our ability to identify patients who will best tolerate and benefit from stem cell transplants. This has markedly reduced the death rate from transplantation and hence has improved survival. This was also published in October 2010 in *Bone Marrow Transplantation* by Dr. Gertz. We continue to have a number of clinical trials investigating new agents that could improve the treatment of amyloidosis. These trials are continuing to accrue patients at

Mayo Clinic. In addition, Drs. Gertz and Dispenzieri are conducting a trial that compares transplantation with a non-transplant approach.

We would also like to mention the work of Ahmet Dogan, M.D., Ph.D., who has developed a technique of mass spectrometry. This instrument, now available in our clinical laboratory, is able to analyze the proteins from patients with amyloid and appropriately define them as amyloid proteins and also classify them as either familial or light chain amyloid from plasma cell diseases. This has actually been a very helpful new test, and it is impacting clinical care, not only for our patients, but for those patients at other institutions where samples can be sent to our lab for testing. We are now doing many of these assays each day in Dr. Dogan's laboratory.

In summary, Mayo Clinic conducts amyloidosis research to discover new treatments and improve patient care. Clinical practice observations become the basis for research studies, and the findings from research flow back into the practice to improve patient care and outcomes. It's an unbroken circle — with physicians, physician-researchers and career scientists working as teams to change the future of medicine.

Thank you for your vote of confidence in our work, and for the message of help and hope your philanthropic partnership gives to the patients and families who count on us for answers.



**Thomas E. Witzig, M.D.**

Professor of Medicine Mayo Clinic College of Medicine  
Principal Investigator, Iowa/Mayo Lymphoma SPORE  
Chair, Hematology Research Mayo Clinic  
Co-chair, Hematologic Malignancies Program in the Mayo Clinic Cancer Center