Q: How did you get into the field of MRS? What was your educational background? Why did you choose MRS research?

Joanne Ingwall:I have a PhD in biophysical chemistry from the Chemistry Department of Cornell University in Ithaca, New York, so I was well prepared academically. I never did MRS as a graduate student or postdoc. When I was a junior faculty at the University of California at San Diego, I was inspired to give it a try by a paper from the Radda group at Oxford University. They put a hunk of muscle in a NMR spectrometer and detected ATP and phosphocreatine. These molecules could be detected because the muscle was not contracting and therefore not using energy. I was in the department of medicine at that time but convinced a chemistry department colleague to let me put a mouse heart in a spectrometer. That was 1976. Shortly later I moved to Boston and learned how to perfuse rat (and then mouse) hearts in a high field MR spectrometer to detect ATP and phosphocreatine in a beating heart. And the rest is history. It was new and it was fun.

Q: When was your first SMRM/SMRI/ISMRM Annual Meeting? What is your memory of it?

Joanne Ingwall:I attended the first SMRM meeting in Boston in 1982. But I witnessed the history of the first meeting - and the creation of SMRM - even before then. I well recall a dinner with Gerry Pohost, Paul Lauterbur, me and our spouses when we talked about forming a NMR society. Then Gerry actually did it! I was invited to become a member of the board at the first meeting.

Q: Back then,

- **were there many trainees (or they were all mostly senior researchers)?**

Joanne Ingwall: They were mostly senior scientists, but postdocs did attend. When I was the president, I created the Young Investigator Award because I thought it was very important to encourage junior scientists. The award still exists.

- **how easy/hard was it to get involved in SMRI/SMRM/ISMRM activities as a trainee?**

Joanne Ingwall: They were certainly welcomed at the meetings.

- **what educational programs were available at the time?**

Joanne Ingwall: Remember that these were early days of the Society. Nonetheless the Society already had sessions for MR technologists and held many special topics workshops throughout the year.

- **what was the ratio technical VS clinical innovations in terms of ISMRM abstracts?**

Joanne Ingwall:I can't give you a number, but I can say that in the beginning there were many technology abstracts demonstrating what could be done in the clinical settings. Now everybody knows about MRI. New techniques must still drive new clinical applications.

Q: We noticed your early abstract entitled "Changes in intracellular Na content during ischemia and reperfusion in the isolated rat heart: Na-23 NMR studies". How did that research start? How did that impact the field?

Joanne Ingwall: This topic became a major part of our research program as a result of the work of Visiting Professor Charles Springer from Stony Brook University. Charlie's lab developed a shift reagent that could be added to the heart perfusate which shifted the extracellular sodium signal away from the intracellular sodium signal. Jim Balschi and John Bittl in my lab even succeeded in using this tool to study sodium movements in the ischemic thigh muscle in the intact rat. By interleaving Na and P acquisitions, we were able to track the ATP and phosphocreatine signals during the same ischemic episode. So we were able to define the energetics of ion movements in both ischemic skeletal and cardiac muscles. Very satisfying research.

Q: What were the challenges 30 years ago VS now that the field evolved?

Joanne Ingwall: Initially the challenge was to figure out whether we could apply what we were doing at the basic research level to the clinical setting. One challenge now is to grow MRS applications. Another is to reduce the cost of MRI/MRS, driven in part by availability and cost of the helium and nitrogen cryogens. Yet another is to bring MRI to developing nations.

Q: Do you have any advice you can give to young MRI researchers on how to make new ground-breaking research?

Joanne Ingwall: Don't be afraid to try new things. You learn from failure as well as success.

Q: Have you ever thought about other jobs outside the MR field?

Joanne Ingwall: No. But after I became a full professor, I became active in mentoring young faculty and postdocs at the Harvard Medical School's teaching hospitals. I miss both the MR research and mentoring.