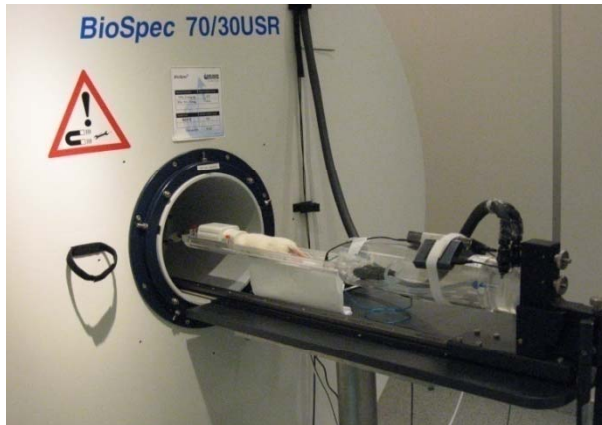


# 8<sup>th</sup> WORKSHOP ON MAGNETIC RESONANCE SPECTROSCOPY AND IMAGING (MRI/MRS)

*Applied to Laboratory animals*

**June 10 -13, 2013**



**Organized by:**

**Servicio de Resonancia Magnética Nuclear**

Universidad Autónoma de Barcelona (UAB)  
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**UAB**  
Universitat Autònoma  
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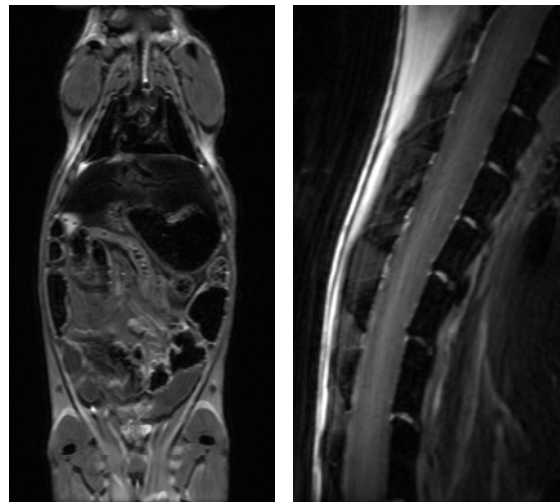
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## Objectives

This workshop provides an introduction to the magnetic resonance imaging (MRI) technique and its application to preclinical studies. A major focus will be hands-on-training using small animals in a 7 Tesla Bruker BioSpec spectrometer.

The course is designed for small groups to facilitate teacher-participant interaction and full participation in the hands-on sessions which constitute 70% of the workshop time.

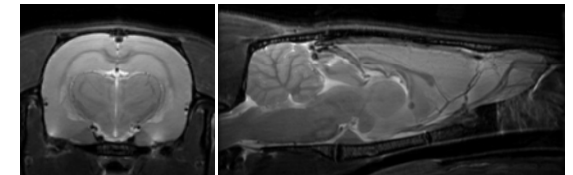


**Workshop limited to 4 participants**

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## Topics

- Safety issues in an NMR facility.
- Description of MRI hardware.
- NMR and MRI basic principles.
- MRI classical sequences.
- Description of ParaVision tools.
- MRI quantification.
- Description of common MRI artifacts.
- Introduction to advanced spectroscopy and diffusion techniques.
- *In vivo* hands-on sessions.



| Registration Fees                         | Until May 1 <sup>st</sup> , 2013 | After May 1 <sup>st</sup> , 2013 |
|---|----------------------------------|----------------------------------|
| Standard                                  | 2.000 €                          | 2.300 €                          |
| Public University or Research Institution | 1.300 €                          | 1.500 €                          |
| UAB member                                | 750 €                            | 900 €                            |

**Course coordinator:**

**Silvia Lope Piedrafita, PhD.**

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# Programme at a Glance

## Workshop on Magnetic Resonance Spectroscopy and Imaging (MRS/MRI) Applied to Laboratory Animals

|               | Day 1   | Day 2  | Day 3   | Day 4   |
|---------------|---|--|---|---|
| 9h00 - 10h30  |   | Acquisition of MRI experiments:<br>Sample positioning, tuning, etc   | Classical MRI sequences (SE, GE, IR, RARE, EPI) I: Theory.          | <i>In vivo</i> MRI I:<br>Animal handling, anesthesia, monitoring.   |
| 10h30 - 11h00 | Welcome   | Break  | Break   | Break   |
| 11h00 - 13h00 | NMR safety issues and policy<br>Work-place description<br>MRI system hardware<br>BIOSPEC USR 70/30<br>(Components, coils, coil selection) | Description of the tools in<br>ParaVision software.                  | Classical MRI sequences (SE, GE, IR, RARE, EPI) I: Hands-on         | <i>In vivo</i> MRI II:<br>In vivo Image acquisition. T1 and T2 weighted images. T1 and T2 maps. FLAIR and STIR images |
| 13h00 - 14h00 | Lunch   | Lunch  | Lunch   | Lunch   |
| 14h00 - 15h15 | Introduction to NMR physics: FID and NMR relaxation T1, T2 y T2*.   | Contrast (T1w, T2w, $\rho_w$ ):<br>Theory and hands-on.              | Introduction to advanced applications I:<br>Localized Spectroscopy. | <i>In vivo</i> MRI III:<br>Localized spectroscopy.<br>Demonstration of common MRI image artifacts                     |
| 15h15 - 15h30 | Break   | Break  | Break   | Break   |
| 15h30 - 17h00 | MRI basics: Gradients, NMR signal, spatial localization and principles of MR image formation.   | MRI quantification: T1 and T2 maps. Data acquisition and processing. | Introduction to advanced applications II:<br>Diffusion.             | <i>In vivo</i> MRI IV:<br>Diffusion. Acquisition of DWI and DTI. ADC and FA maps                                      |