

DO1. Minutes of the Kickoff meeting

Date: 29.09.2020.

Place: Online Kickoff Meeting (Zoom)

Participants:

PRECAST research team: Dr Nikola Knežević, Dr Ivana Gadjanski, Dr Ivona Janković-Častvan, Mila Djisalov, Kristina Živojević, Minja Mladenović

Project supporting researchers and guest participants: Dr Maria Santos-Martinez, Dr Oliviero Gobbo, Dr Eduardo Ruiz Hernandez (from [Trinity College Dublin, the University of Dublin](#)); Dr Aldrik Velders (from [Wageningen University](#)); Mirjana Mundžić (new PhD student, planned to enroll in PRECAST research)

Description: On September 29, 2020, we held an Online Kickoff meeting of the PRECAST project, funded by the Science Fund of the Republic of Serbia, with the following agenda:

12:00 – 12:20 The coordinator of PRECAST, Dr Nikola Knežević, presented the BioSense Institute, project concept, planned activities and the PRECAST team.

12:20 – 12:30 Dr Maria Santos-Martinez introduced her team from Trinity College Dublin and their research interests.

12:30 – 12:40 Dr Ivona Janković Častvan introduced her institution (Faculty of Technology and Metallurgy, University of Belgrade) and her role in the PRECAST research

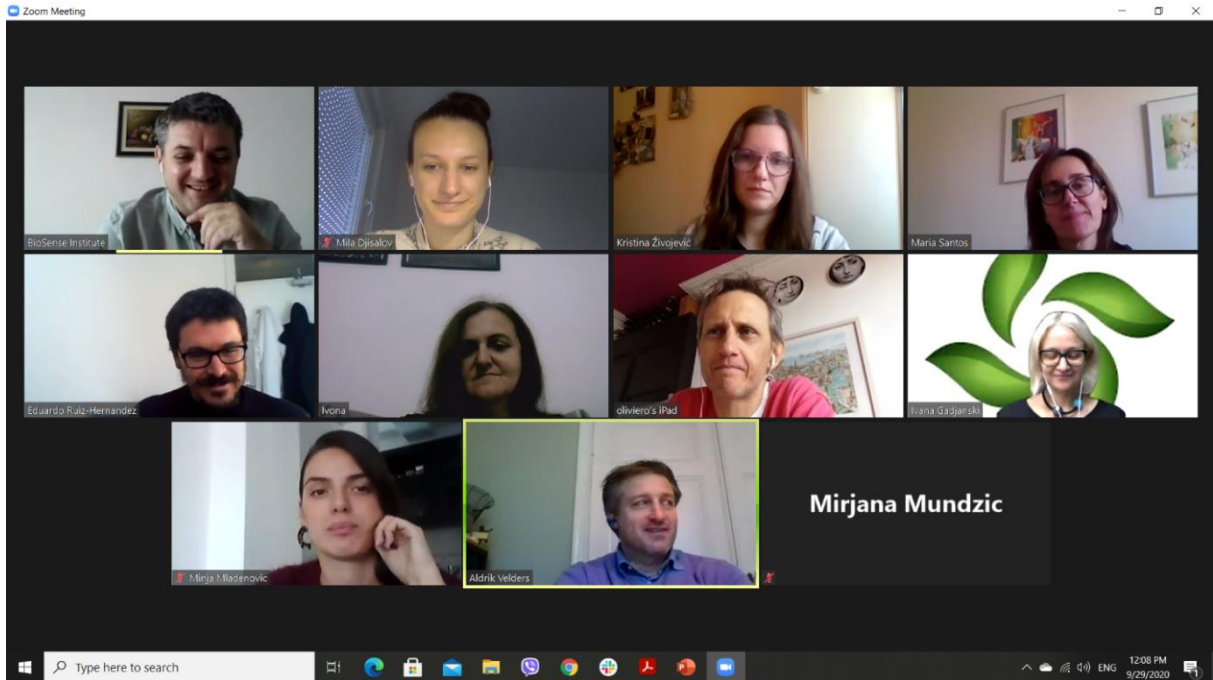
12:40 – 13:00 Kristina Živojević gave a presentation on the basics of magnetic resonance imaging (MRI) and recent research achievements in the use of nanomaterials for MRI of cancer

13:00 – 13:20 Minja Mladenović gave a presentation on the topic of stimuli-responsive cancer targeted therapy using mesoporous silica nanoparticles (MSN)

13:20 – 13:35 Mila Đisalov presented the research findings about Glioblastoma Multiforme (GBM) and different methodologies for cancer targeting through functionalization of MSN with ligands for specific interaction with cancer-overexpressed receptors.

13:35 – 13:50 Dr Ivana Gadjanski presented her previous research results in the area of applications of MRI for imaging neural tissues.

13:50 – 14:00 Dr Nikola Knežević, Q&A session, closing statements



Screenshots by Mila Djisalov, Novi Sad, 29.09.2020.

Magnetic Resonance Imaging (MRI)

- MRI represents a medical imaging technique based on the principles of **Nuclear Magnetic Resonance (NMR)** that uses **strong magnetic fields and radio waves** to produce images of body structures.
- Inside the strong magnetic field, randomly orientated proton spins become aligned with the powerful magnet. A rapidly repeating sequence of radiofrequency (RF) pulses – produced by the scanner – then causes excitation and resonance of protons. As each radiofrequency pulse is removed, the protons relax to realign with the magnetic field, and as they do so they give off radiofrequency signal which is detected by the scanner and transformed into an image.

The diagram illustrates the MRI process in four stages:

- Free protons:** Shows randomly oriented red arrows representing proton spins.
- Proton alignment:** Shows red arrows aligned vertically, representing the effect of a strong magnetic field.
- Radiofrequency pulse:** Shows a yellow wavy line representing the pulse causing the protons to precess.
- Relaxation (signal generation):** Shows the protons returning to their original random orientation, releasing energy as a signal.

Source: Science Fund of the Republic of Serbia
https://www.radiologymasterclass.co.uk/tutorials/mri_signal