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10th and 11th May

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PART 3

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A superhydrophobic coating that will stop any corrosion

Damir Hamulić,
Jožef Stefan International Postgraduate School, Ljubljana

Poster number: 23

Problem

dirty shoes

stains

fouling hulls

dirty cars

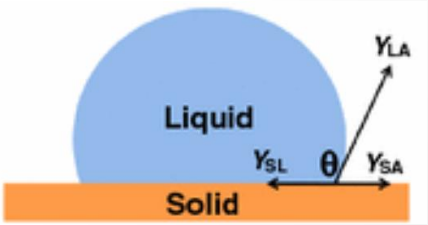
fogged mirrors

Superhydrophobic coatings

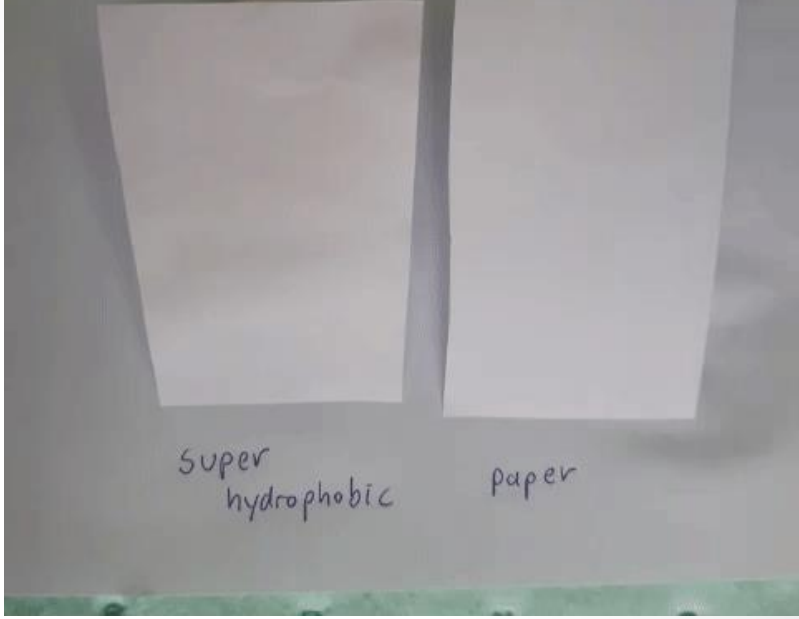
- Protection of steel structures in maritime (ships, ports cranes…)

Copper Statue: Tartini Square, Piran

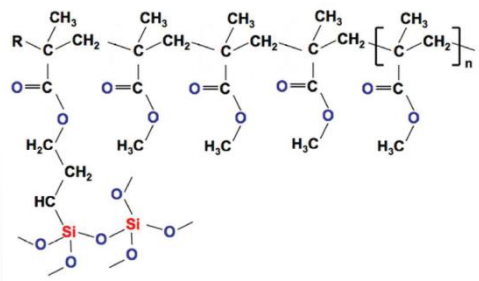
- Corrosion: $M \rightarrow M^{+} + e^{-}$
- Theory of superhydrophobicity:



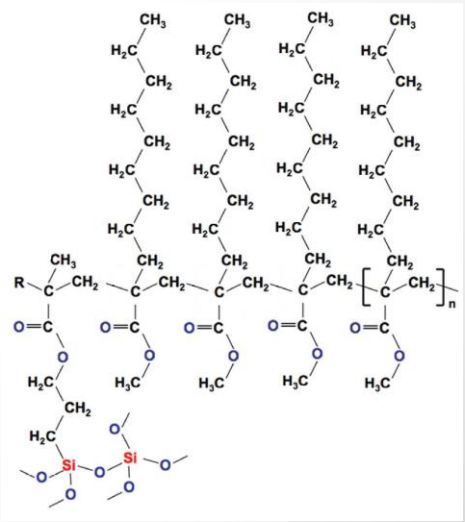
Synthesis of superhydrophobic coatings



- Upgrading existing coatings with good anti-corrosion properties
- Change the basic monomer with longer alkyl chains and fluorinated molecules



Already known coatings



Modified coatings

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DFT study of adsorption of azoles on $Cu_2O(111)$

Dunja Gustinčič,

Jožef Stefan Institute

Poster number: 41

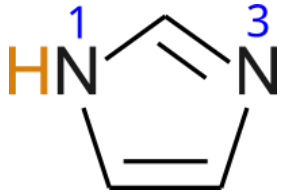
Introduction

Corrosion inhibitors: substances used in a very small amount that significantly reduce the rate of corrosion processes.

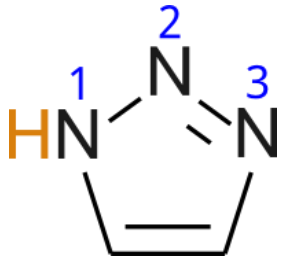
Azole molecules

- five-membered nitrogen heterocyclic ring molecules

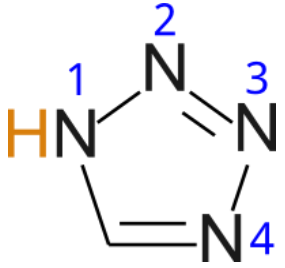
imidazole



triazole



tetrazole



Aim of work

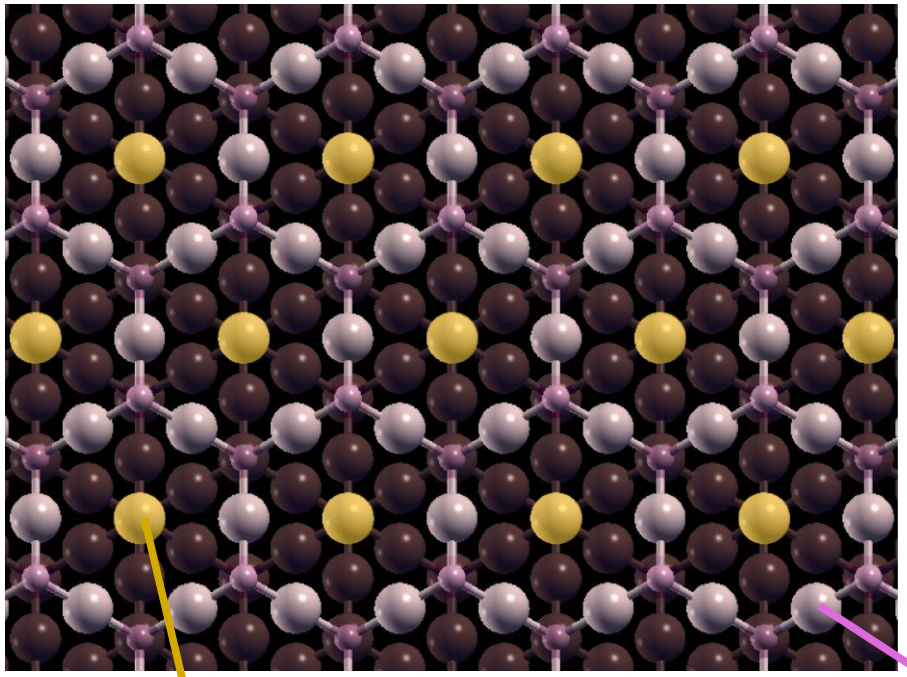
Molecular adsorption is a prerequisite for achieving inhibition.

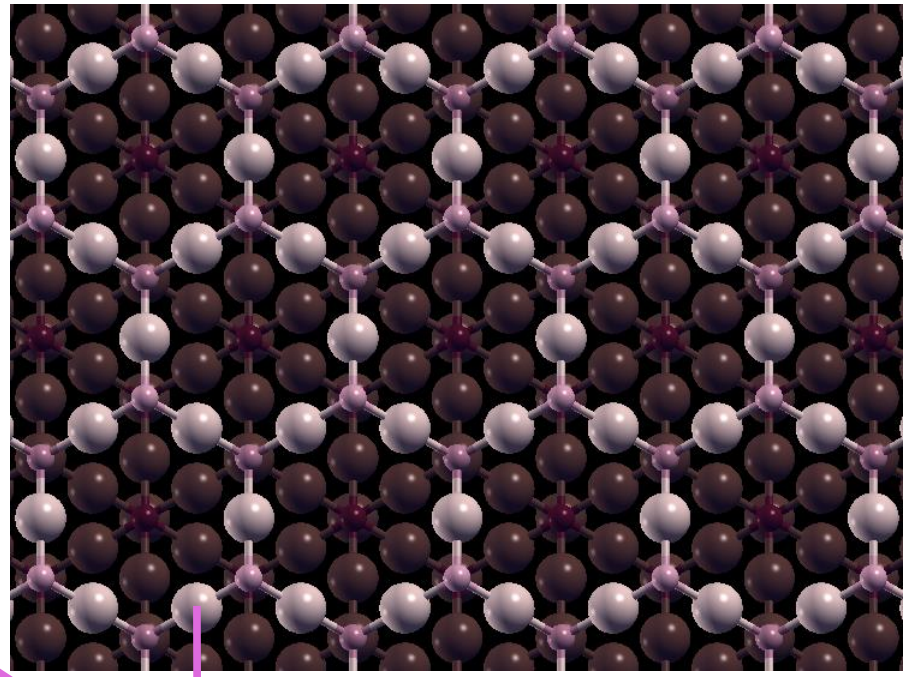
Aim: to characterize the interaction of imidazole, triazole, and tetrazole with
Cu_2O model of oxidized copper surfaces.

Surface structures

stoichiometric
$Cu_2O(111)$

nonstoichiometric
$Cu_2O(111)$-w/o-CUS



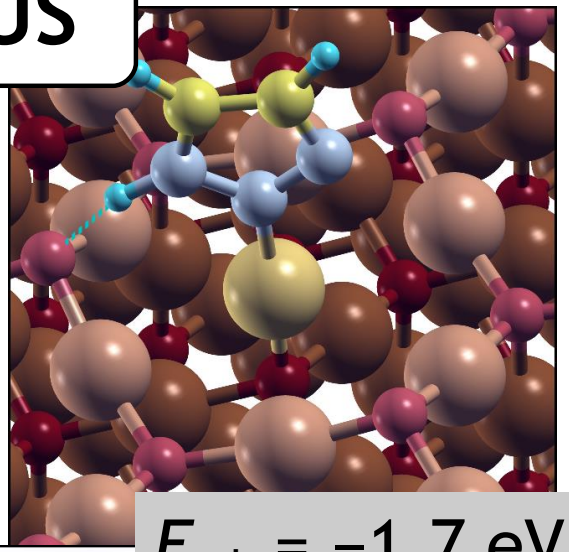


CUS ≡ **c**oordinatively **un**saturated Cu site

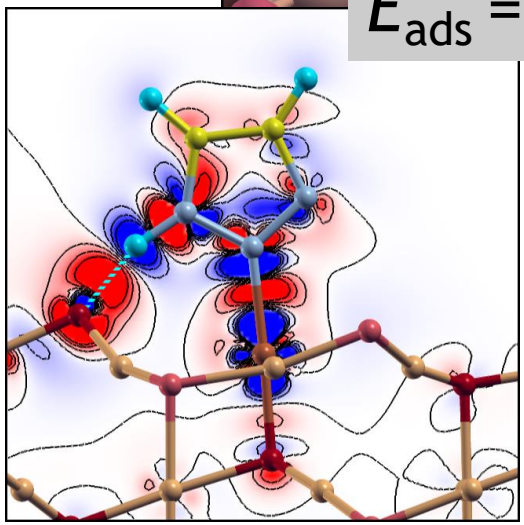
CSA ≡ **c**oordinatively **sa**turated Cu site

Triazole bonding to CUS & CSA

@ CUS

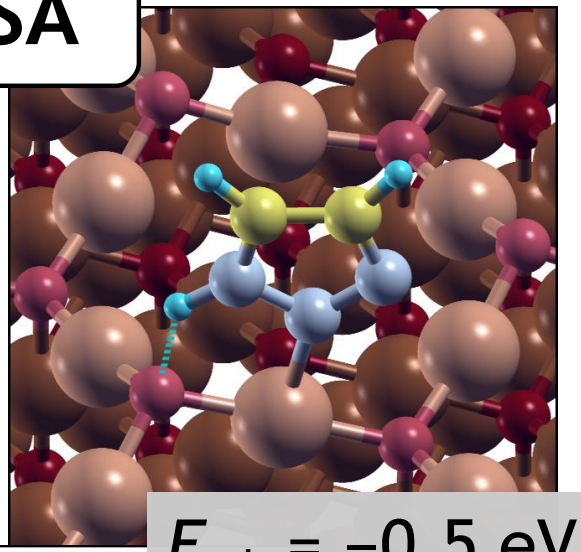


E_{ads} = −1.7 eV

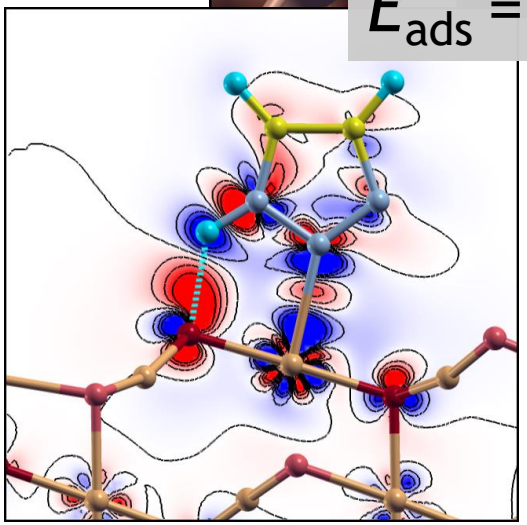


electron excess
electron deficit

@ CSA

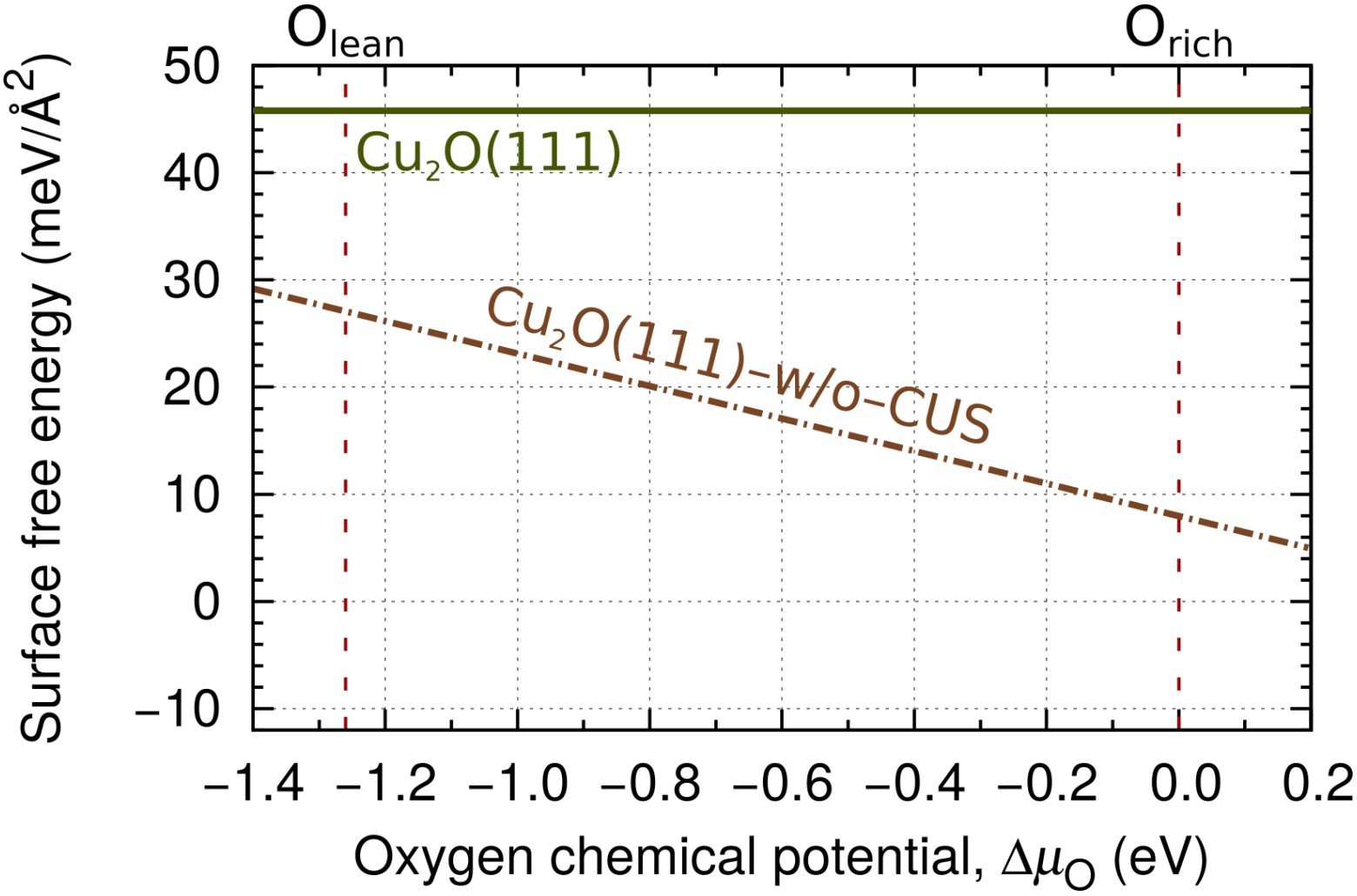


E_{ads} = −0.5 eV

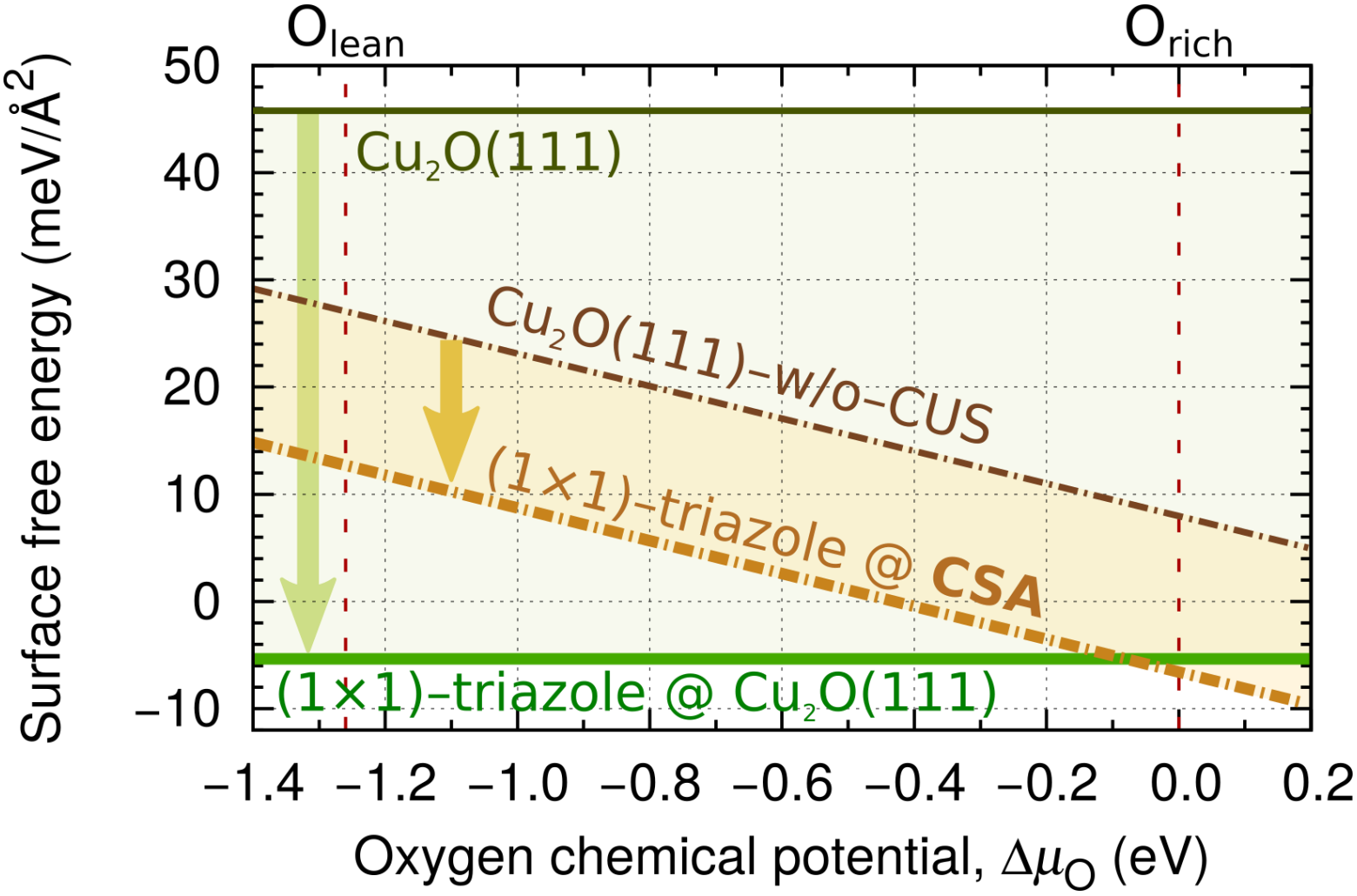


CUS ≡ **C**oordinatively **UnS**aturated site & **CSA** ≡ **C**oordinatively **SA**turated site

Adsorption stabilized surfaces



Adsorption stabilized surfaces



References:

D. Gustinčič, A. Kokalj, *Phys. Chem. Chem. Phys.* 2015, **17**, 28602–28615.

D. Gustinčič, A. Kokalj, Metals 2018, **8**, 310; *ibid.* 2018, **8**, 311.

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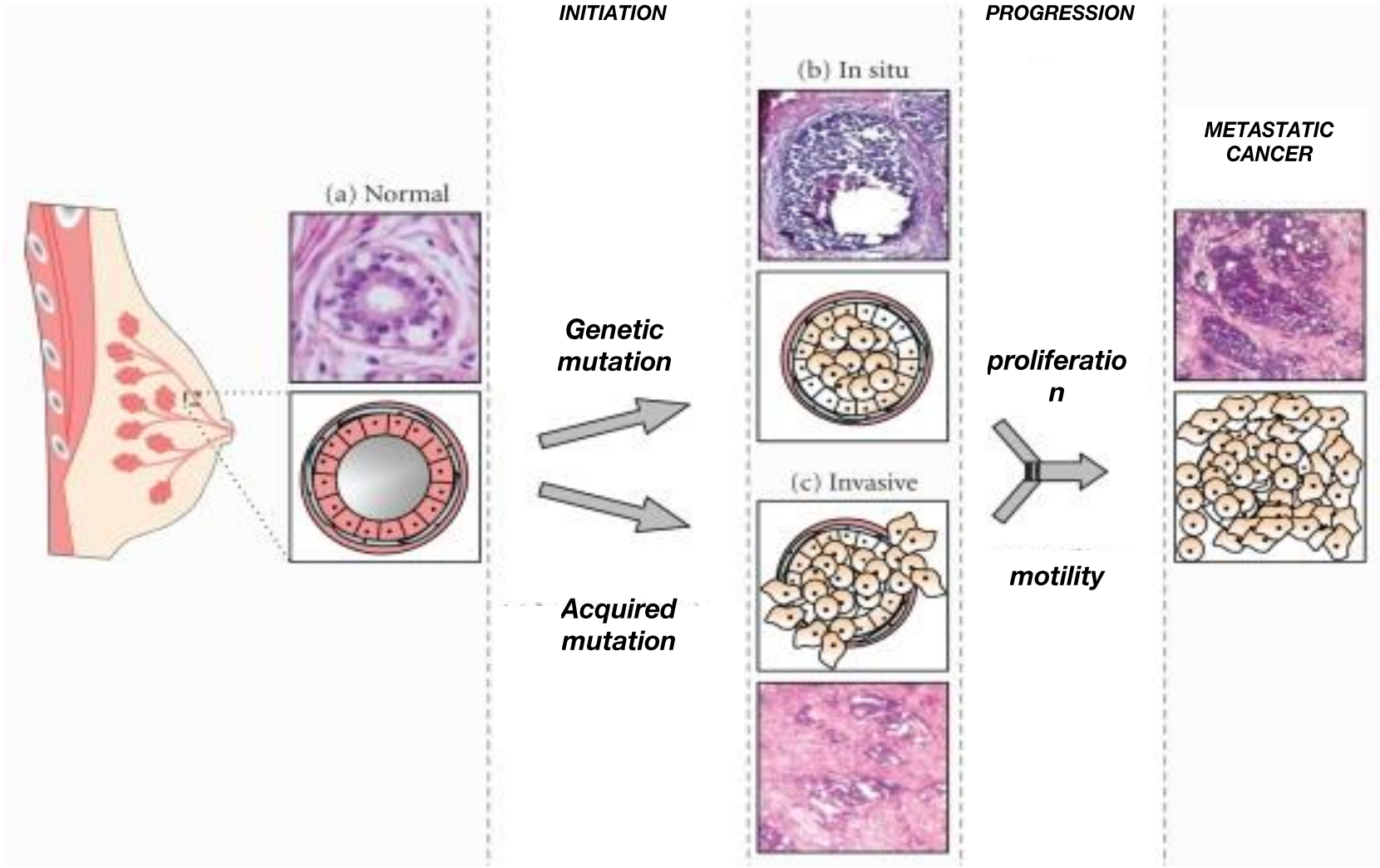
Lipid droplets – potential targets in breast cancer therapy

Eva Jarc

Jožef Stefan Institute, Department of Molecular and Biomedical Sciences

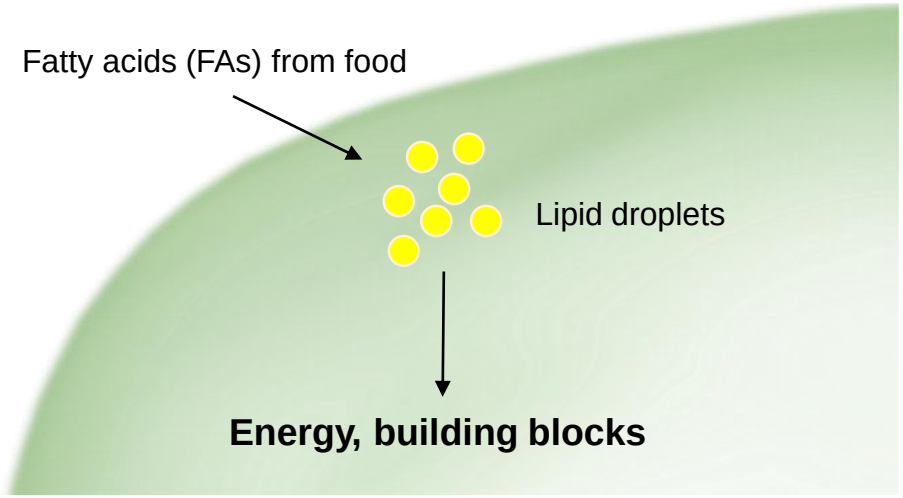
Poster number: 12

Breast cancer development

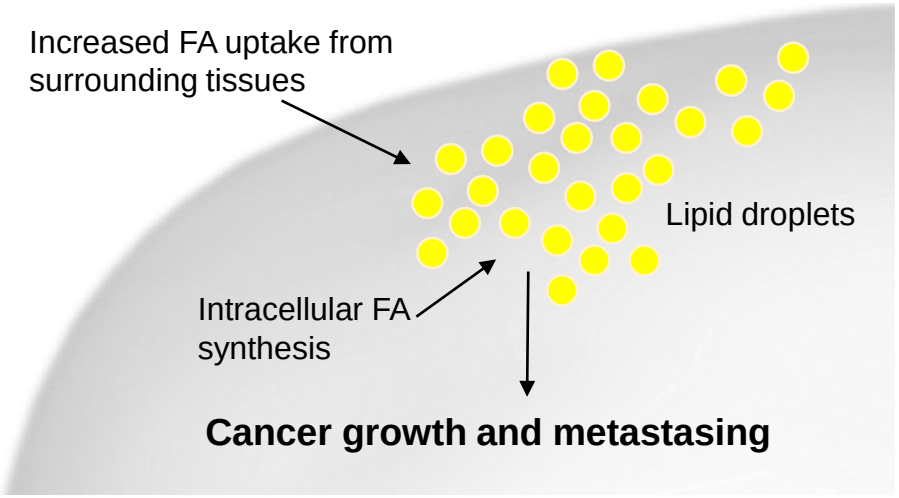


Cancer cells need fatty acids to satisfy their lipid requirements

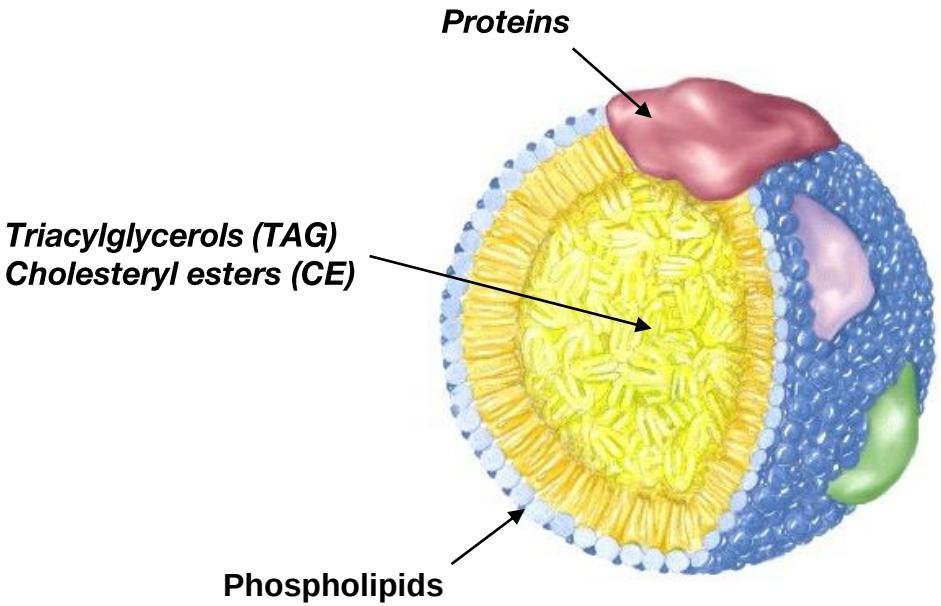
Normal cell – slow proliferation



Cancer cell – fast proliferation

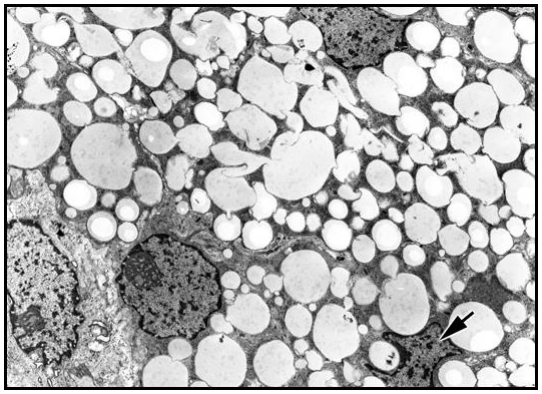


Cancer cells accumulate lipid droplets

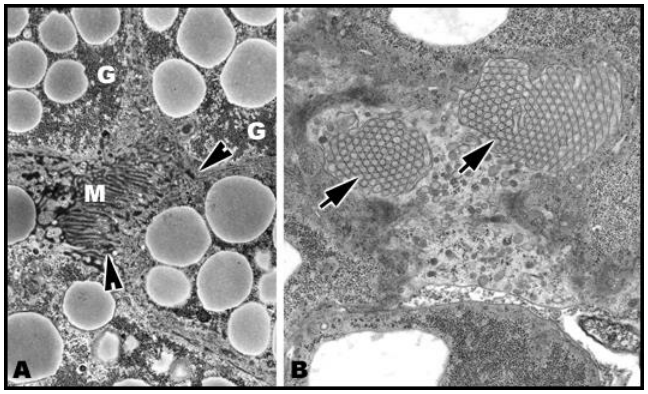


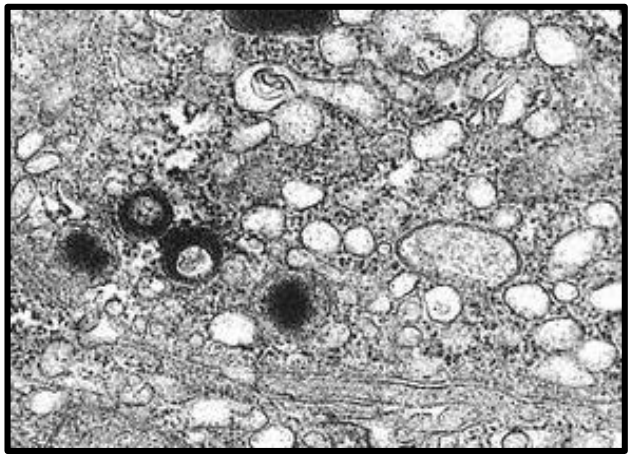
Cancer cells accumulate lipid droplets

Adrenal gland tumour



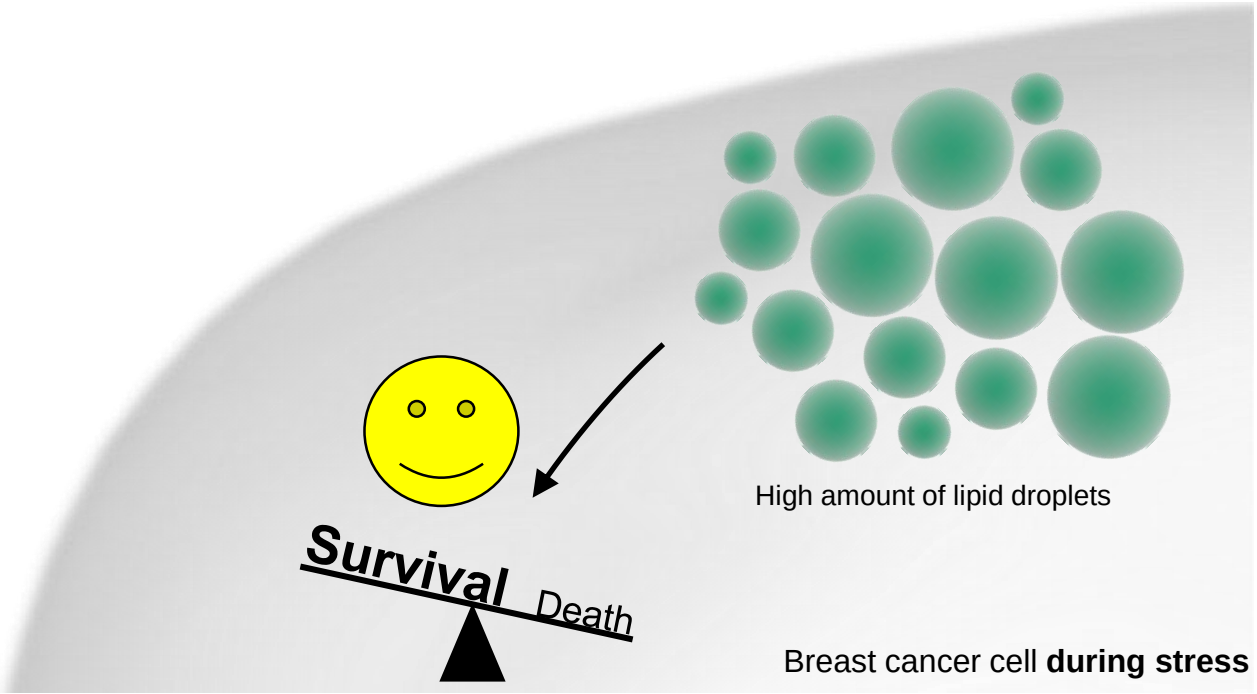
Renal cell carcinoma





Breast, malignant

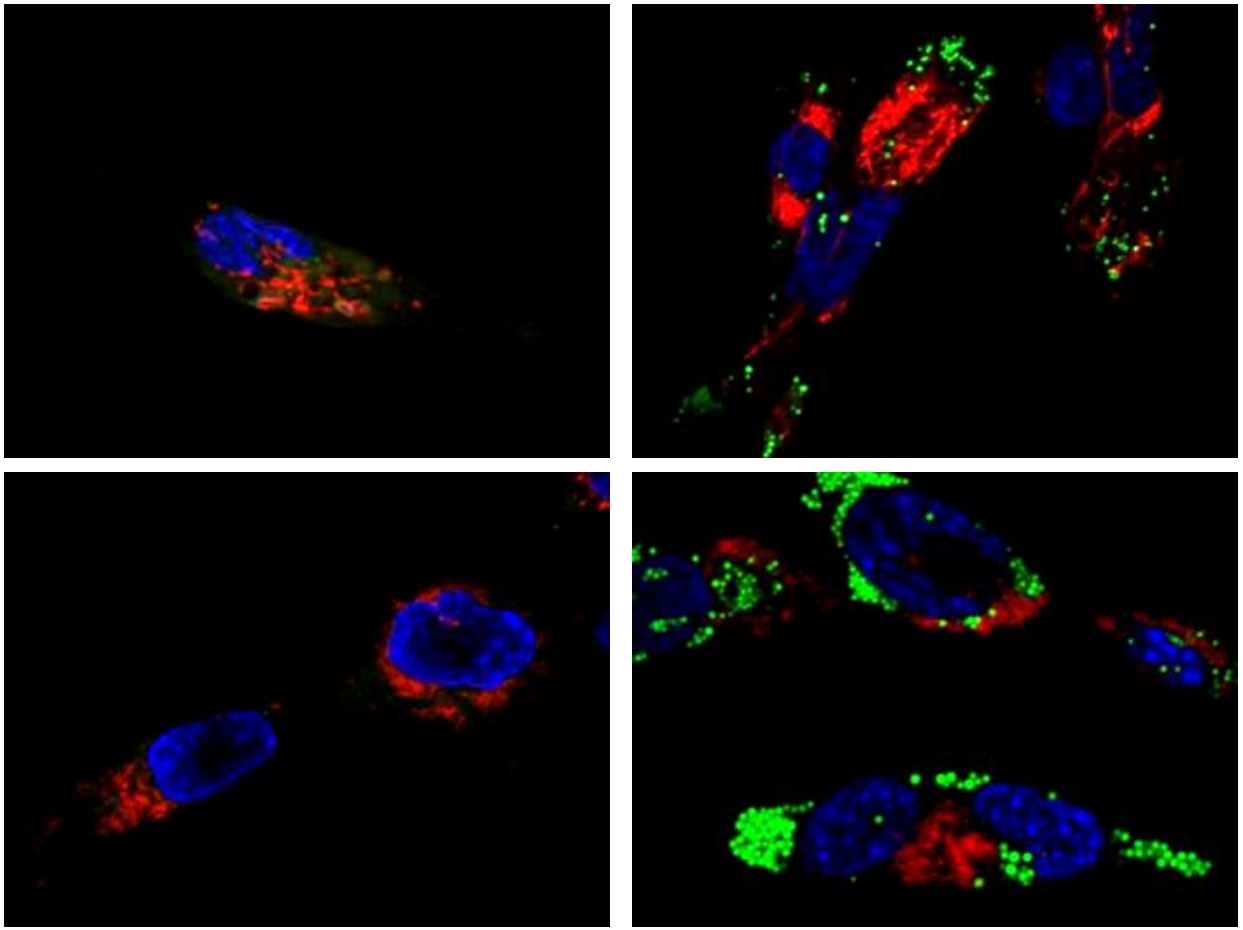
Lipid droplets are involved in breast cancer survival during stress



Lipid droplets are involved in breast cancer survival during stress

Control breast cancer cells

Breast cancer cells during stress



Breast cancer cells with defect in LD synthesis during stress

Breast cancer cells with defect in LD degradation during stress

Targeting lipid droplets to prevent breast cancer survival

Lipid droplet group at Department of Molecular and Biomedical Sciences, Jožef Stefan Institute

- Assist. Prof. Toni Petan
- Eva Jarc, PhD student
- Ana Kump, PhD student
- Maida Jusović, PhD student
- Ema Guštin, MSc student
- Toni Nagode, MSc student
- Pia Starič, MSc student
- Barbara Lipovšek, MSc student

- Dr. Anja Pucer Janež
- Dr. Vesna Brglez

Jožef Stefan Institute

You are welcome to lipid droplet poster n. 12!

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Arrest the corrosion of aluminum alloys using the synergistic effect of green inhibitors

Dževad Kozlica

[1] Jožef Stefan Institute, Department of Physical and Organic Chemistry, Ljubljana, Slovenia

[2] Jožef Stefan International Postgraduate School, Ljubljana, Slovenia

Poster number: 42

Corrosion and aluminum alloys

- Usage
- Reactivity
- Cost
- Protection (Arresting the corrosion)

Materials and Methods

- 2 mm thick copper foil in the shape of discs of 15 mm in diameter
- the specimens grounded mechanically with successive SiC papers of gradation 1200, 2400, 4000.
- Cleaning of samples in ethanol in an ultrasonic bath, rinsing with distilled water and drying with nitrogen gas.

- electrochemical polarization methods

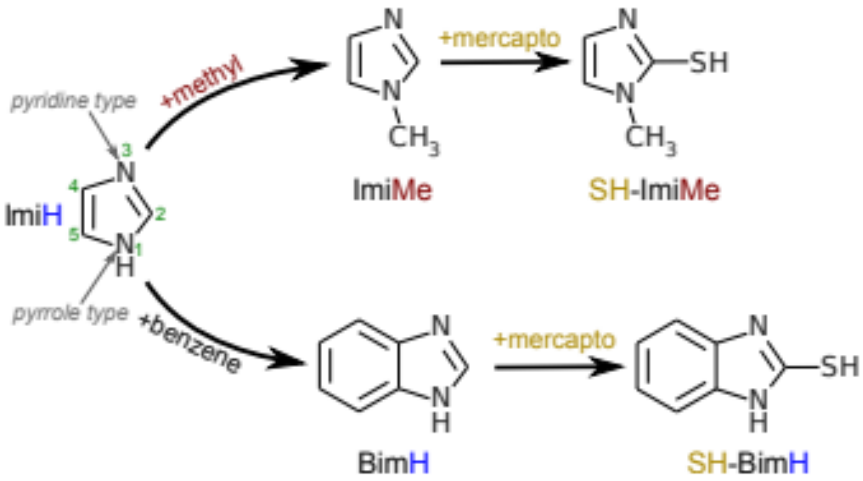


Fig. 1. Skeleton structures of different imidazole inhibitors.

Results

Linear polarization resistance

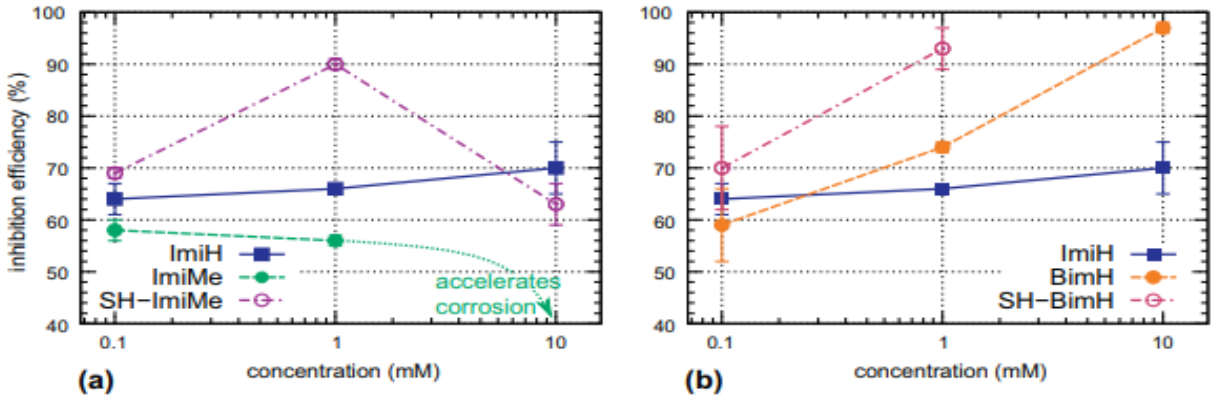


Fig.2. Inhibition efficiency

Potentiodynamic curves

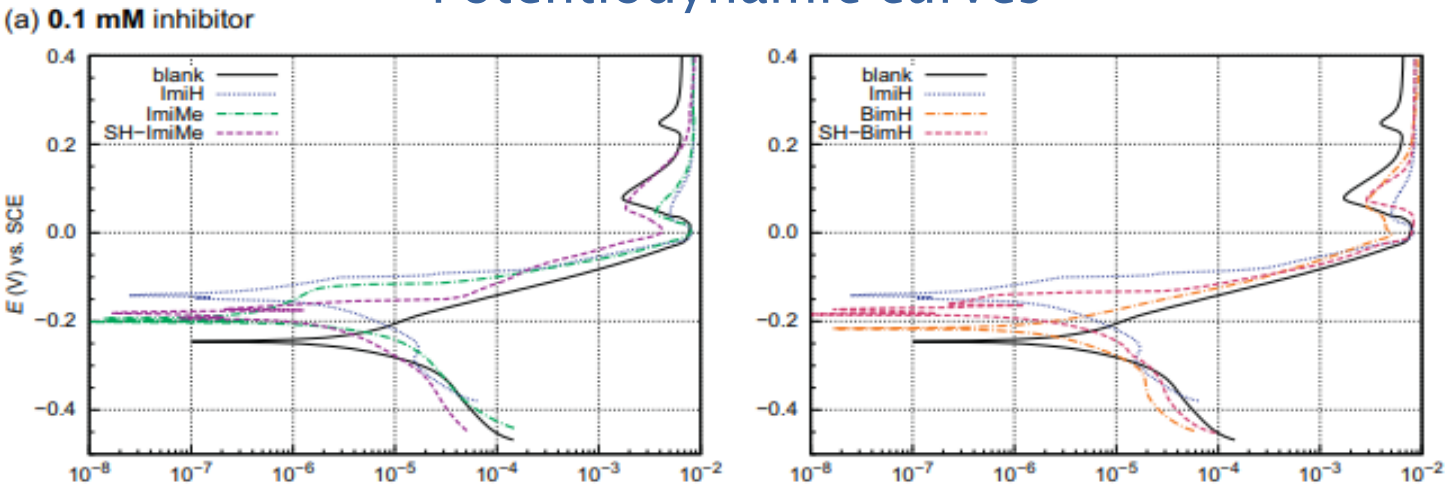
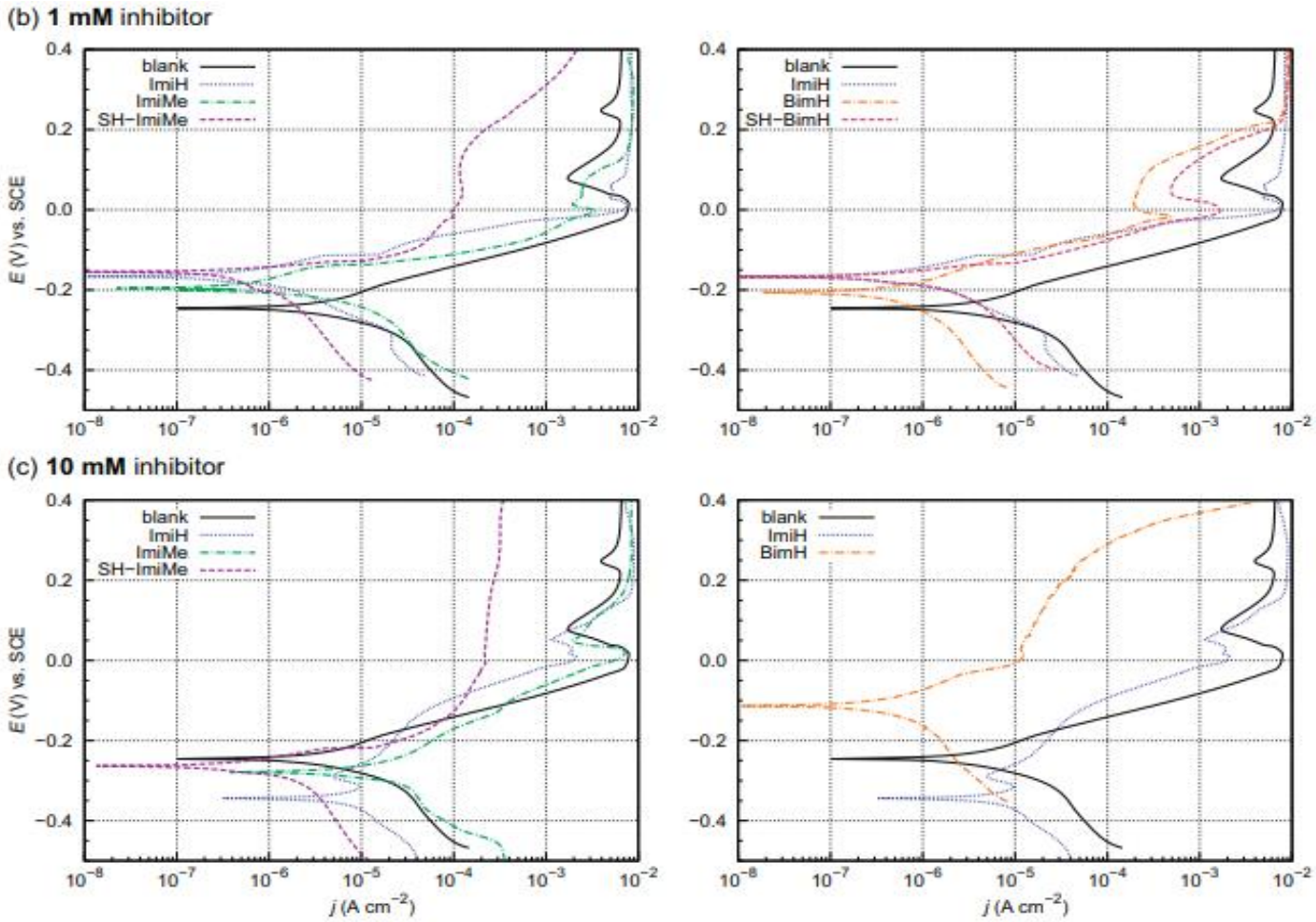


Fig . 3. Potentiodynamic curves recorded for copper without and with addition of inhibitor



❖ At 1 mM concentration the order of inhibition efficiency:

ImiMe < ImiH < BimH < SHImiMe < SH-BimH

➢The synergistic effect of inhibitors
* (the future work) *

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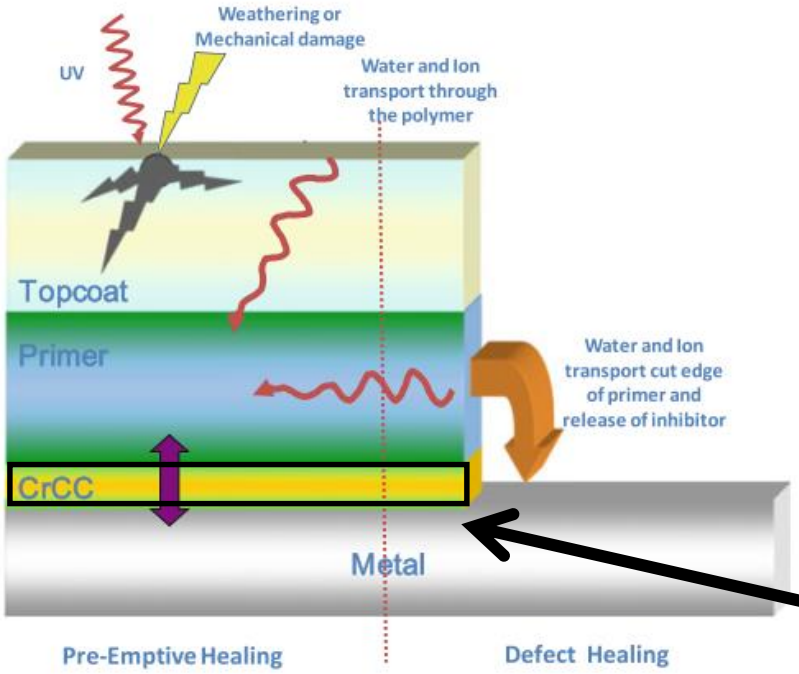
Optimization of zirconium based conversion coatings applied on aluminium alloy ENAB-AlSi7Mg0.3

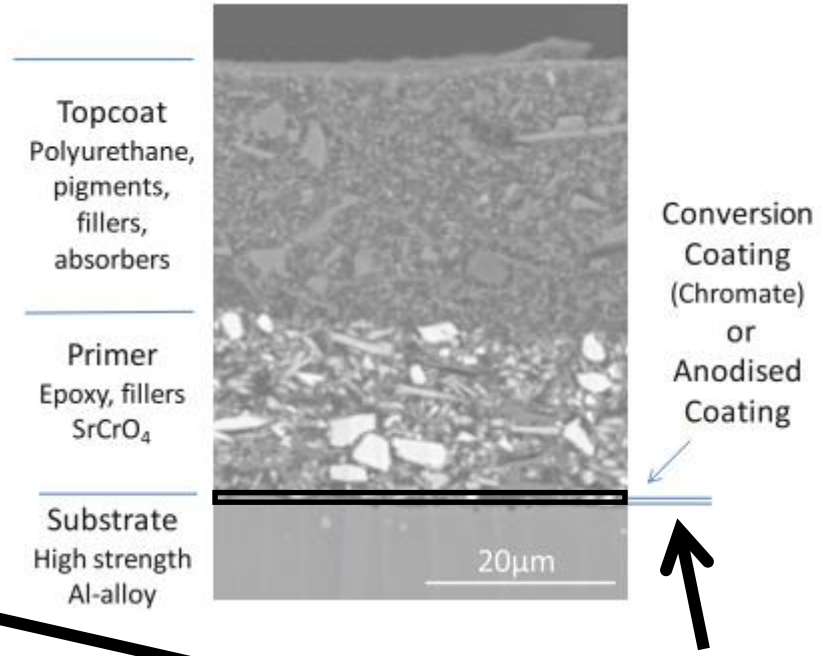
Gavrilo Šekularac

Jožef stefan institute, Department of Physical and Organic Chemistry, Ljubljana, Slovenia

Jožef Stefan International Postgraduate School, Nanoscience and Nanotechnology Ljubljana, Slovenia

Poster number: 31





Conversion Coatings
100-200nm thick

- **Surface pre-treatment**
- **Better adhesion of top paint**
- **Corrosion protection**

Conversion Coating Process is 1st step in application of paints

If Conversion Coating Fails whole paint system will fail

Conversion coating process Requirements

- **Non-toxic and green process**
- **Safe, simple and cheap process**
- **Energy saving**
- **Short process time – 5min**
- **Good corrosion protection**

State of the art conversion coatings process

- Hexavalent chromate conversion coating (CCC)
  (**Best performance, Cancerogenic, Forbidden**)

- Trivalent chromate process (TCP)
- Zirconium/Titanium conversion coatings
- **Zirconium conversion coatings** → ***Meet almost all requirements***

General Aim

Find replacement for chromate conversion coatings

Rare earth conversion coatings
Sol-gel coatings
Trivalent chromate process – TCP
Zirconium conversion coatings

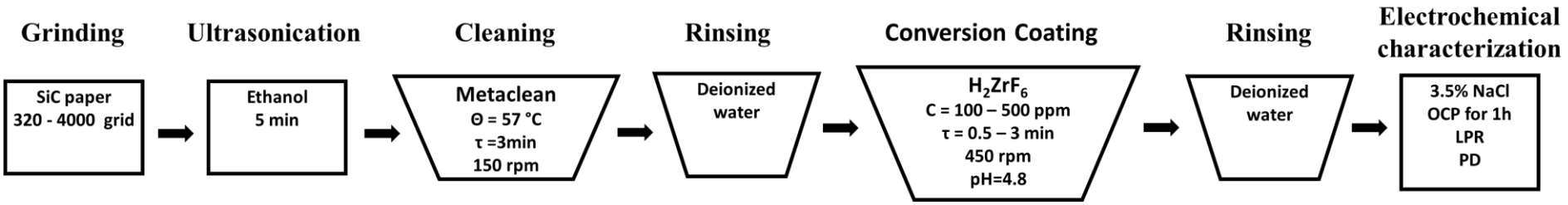
- **Commercialized**
- **Most promising**

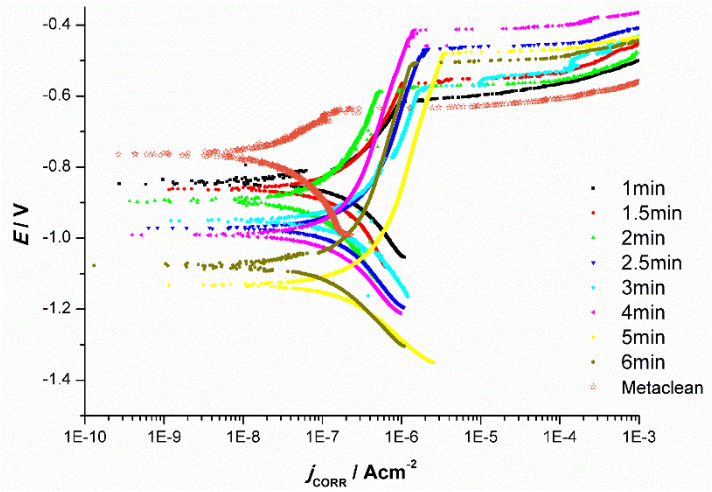
Aim

Optimization of process parameters

(concentration of H_2ZrF_6, process time, surface cleaning, temperature)

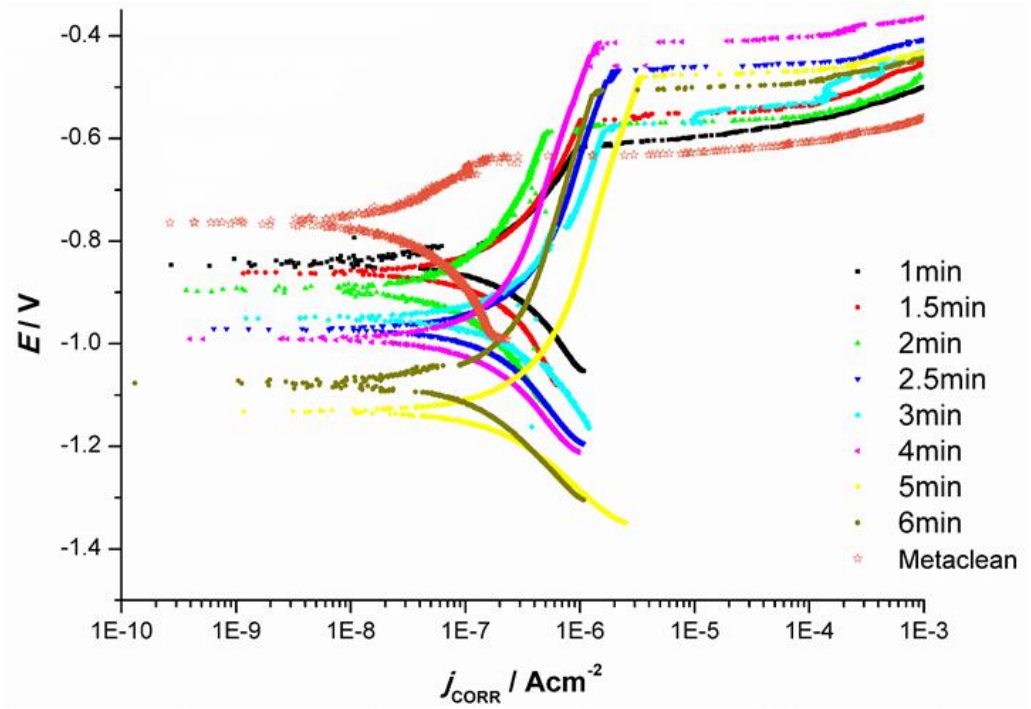
Experimental





Results

Potentiodynamic polarization curves



Conclusions

- Optimal process time was **3 – 4 min**
- Optimal concentration of H_2ZrF_6 was in range **150 – 200 ppm**

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Modern magnets for a modern society

Tomaž Tomše

Department for Nanostructured Materials, Jožef Stefan Institute, Ljubljana, Slovenia

Poster number: 14

I really like magnets…

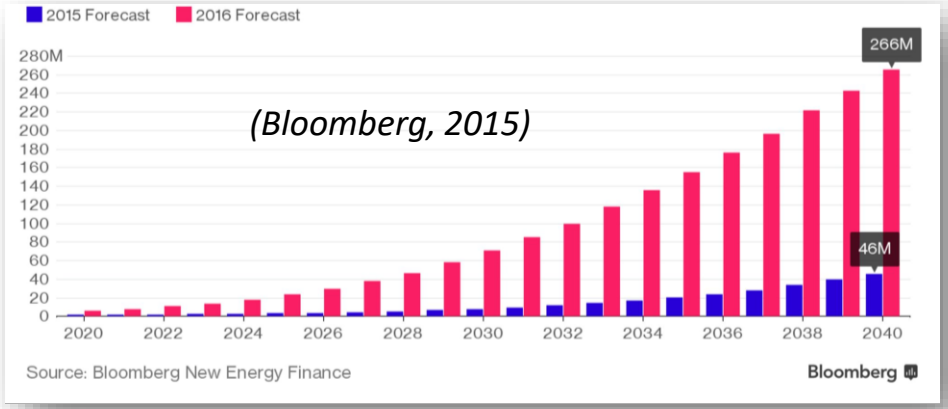
- ✓Computers
- ✓Cell phones
- ✓Cameras
- ✓Washing machines, air conditioners,…
- ✓Automobiles

Nd-Fe-B magnets:

(state of the art)

- Electricity generation
- Electric vehicles

Electric vehicle market (predictions):



(Bloomberg, 2015)

- Lower battery costs
- Reduced dependence on fossil fuels
- Low impact on the environment

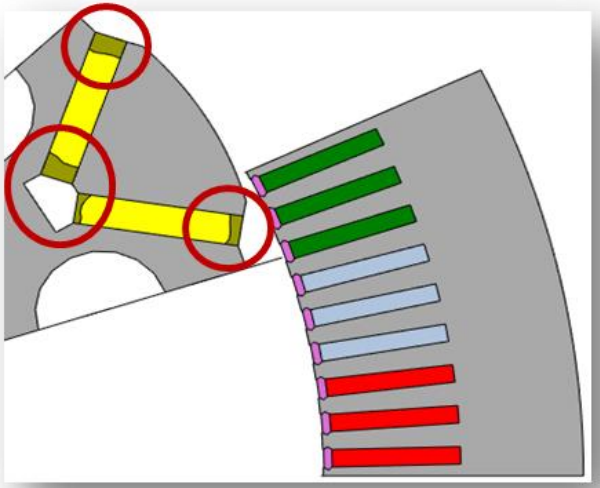
Intrinsic coercivity:

(resistance to demagnetization)

- Important in electric motors
  (magnets exposed to strong reverse magnetic fields)
- Increased with **expensive dysprosium (Dy)**

Price (€ per kg)
Nd: ~ 50
Dy: ~ 300

How to lower the price???



-----> **Our idea:** **Place Dy only where needed…**

MULTICOMPONENT MAGNETS

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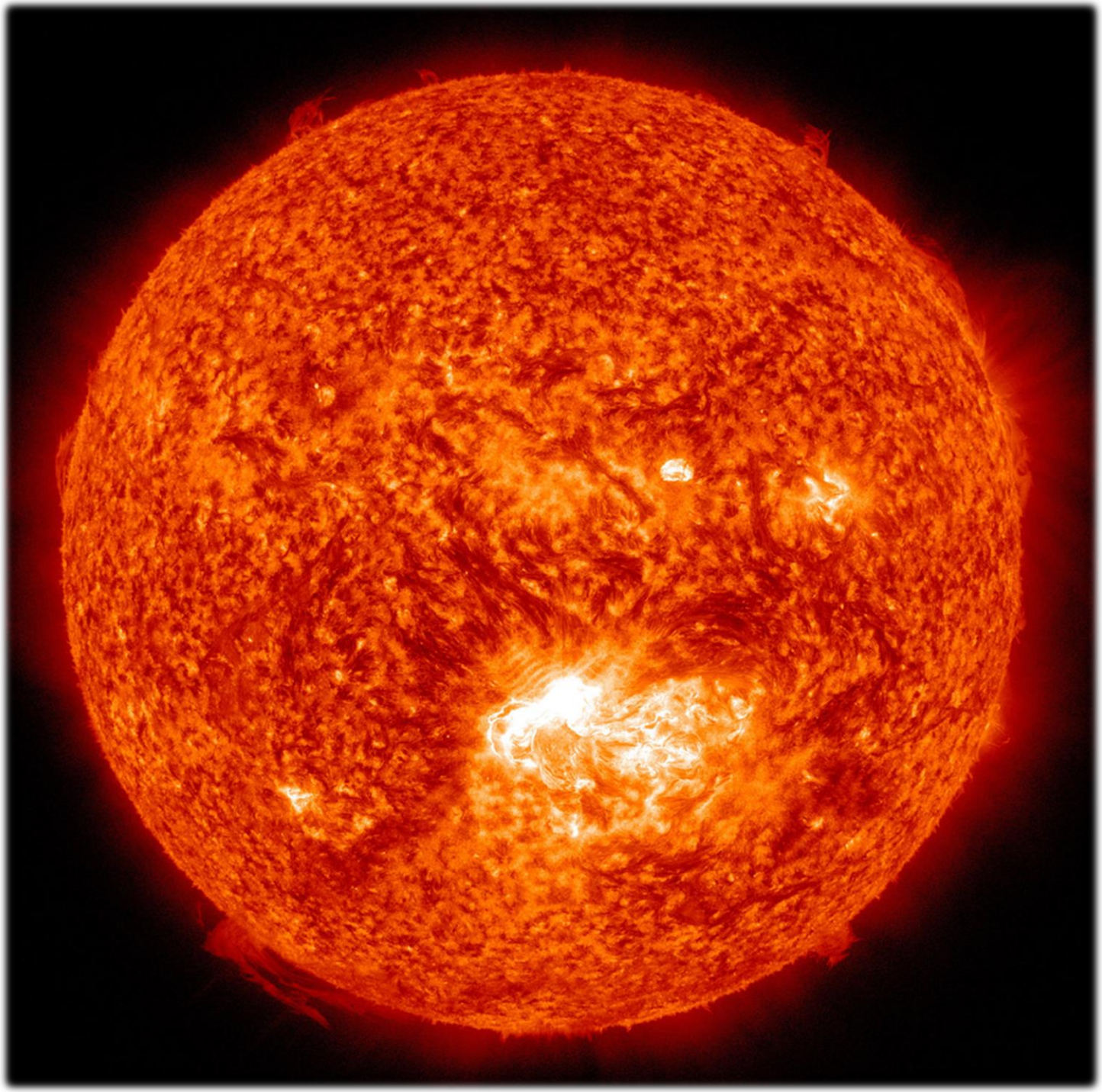
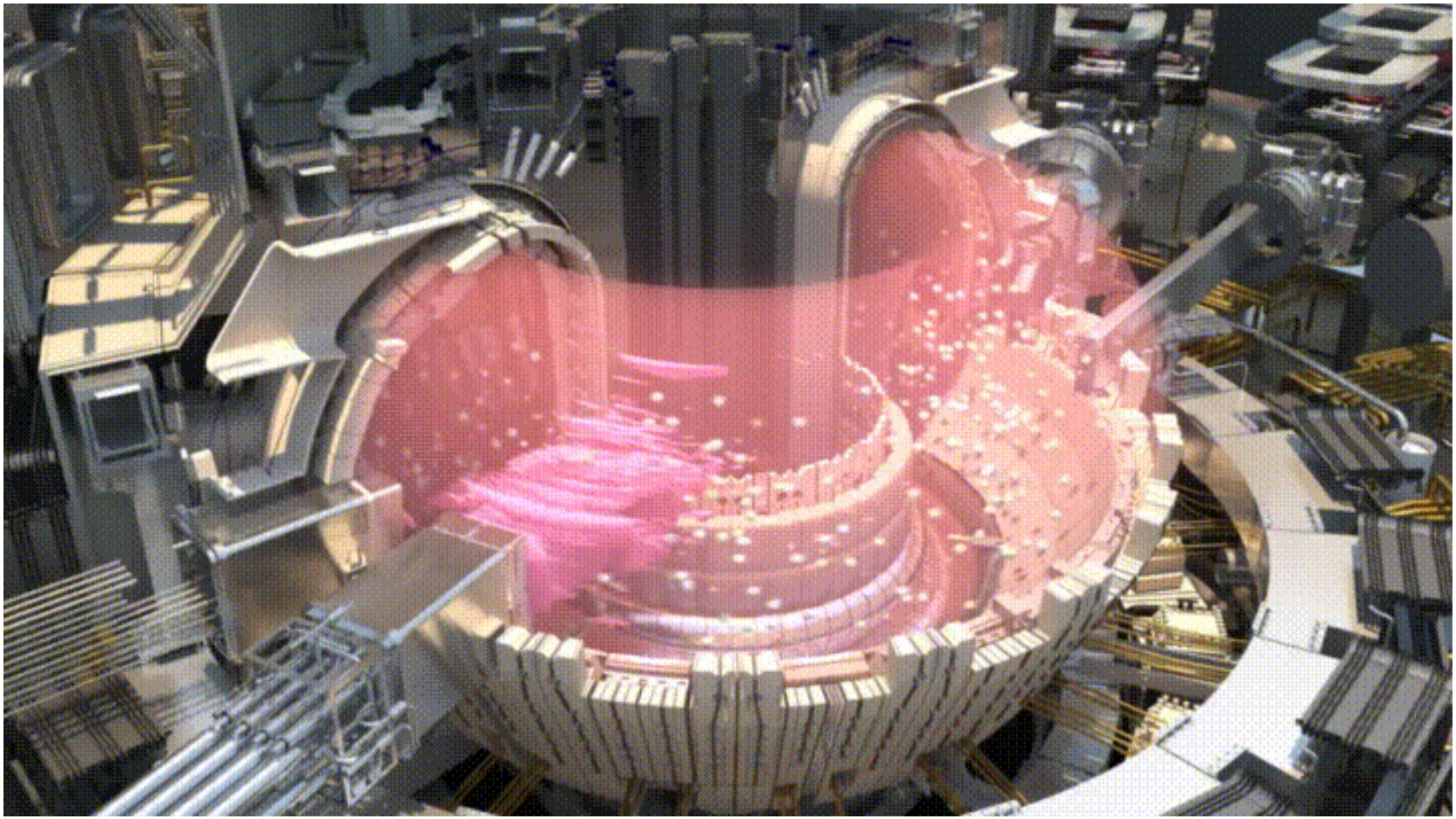
Capturing the Sun in a tungsten "box"

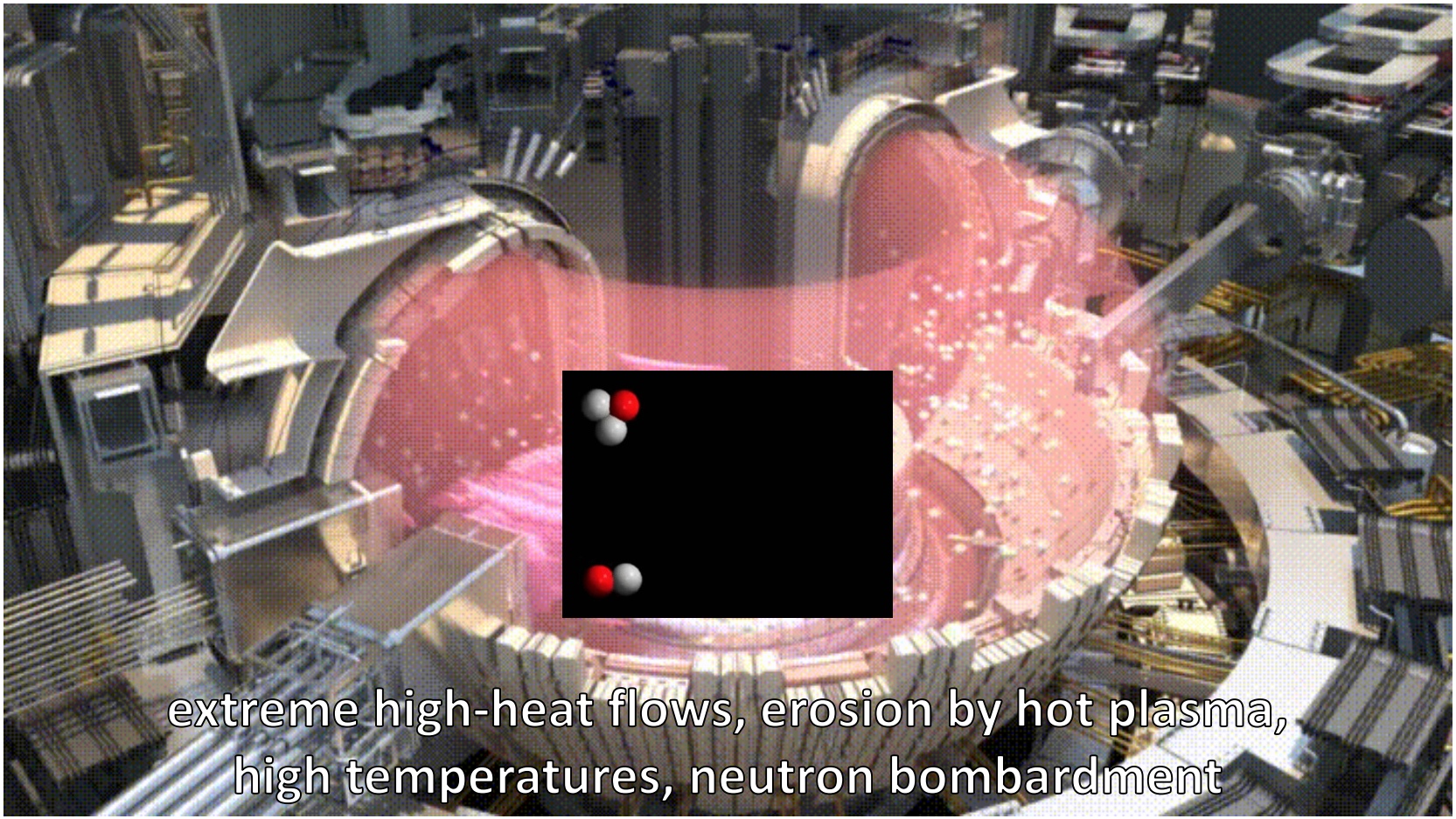
Matej Kocen

Department for Nanostructured Materials, Jožef Stefan Institute

Poster number: 5

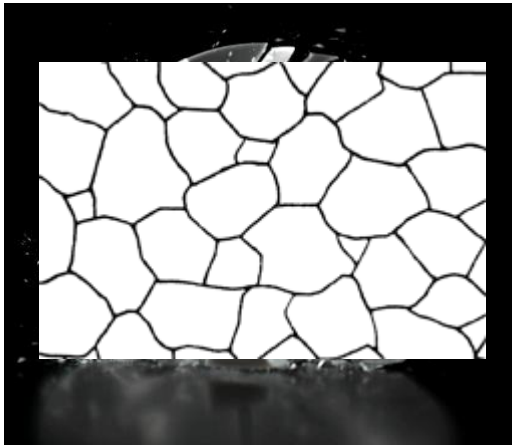




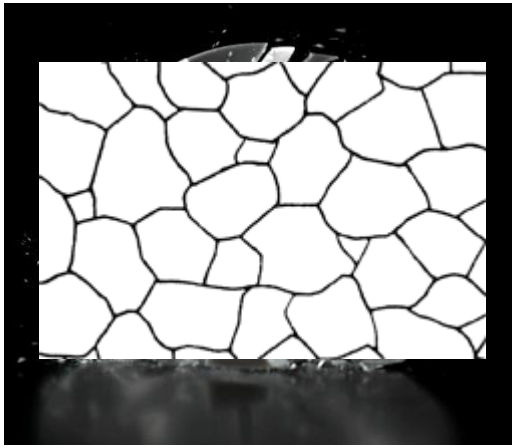

extreme high-heat flows, erosion by hot plasma,
high temperatures, neutron bombardment

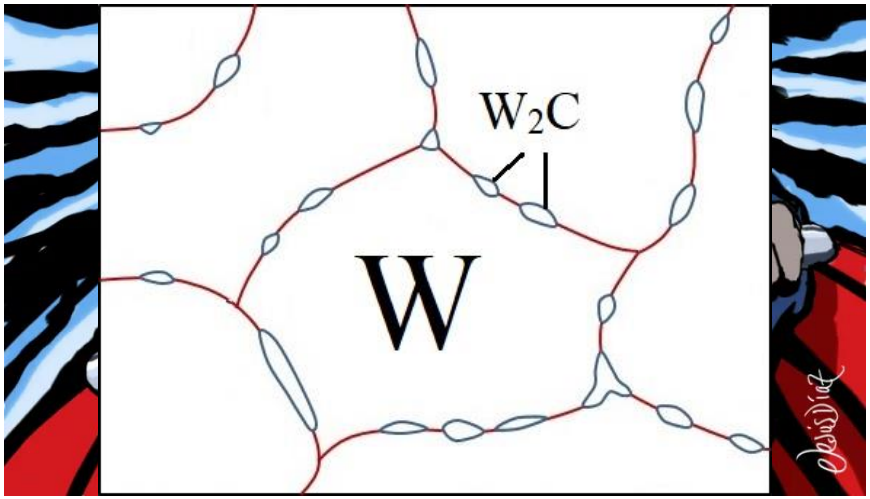
Tungsten

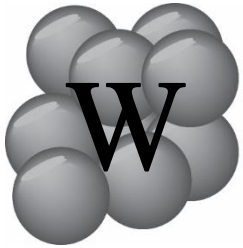
Tungsten

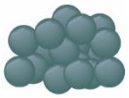


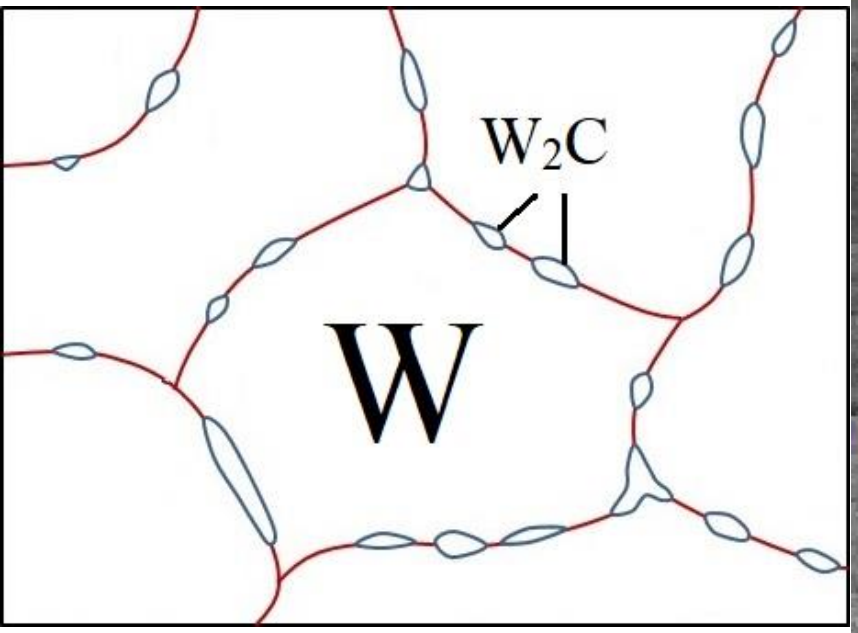
Tungsten

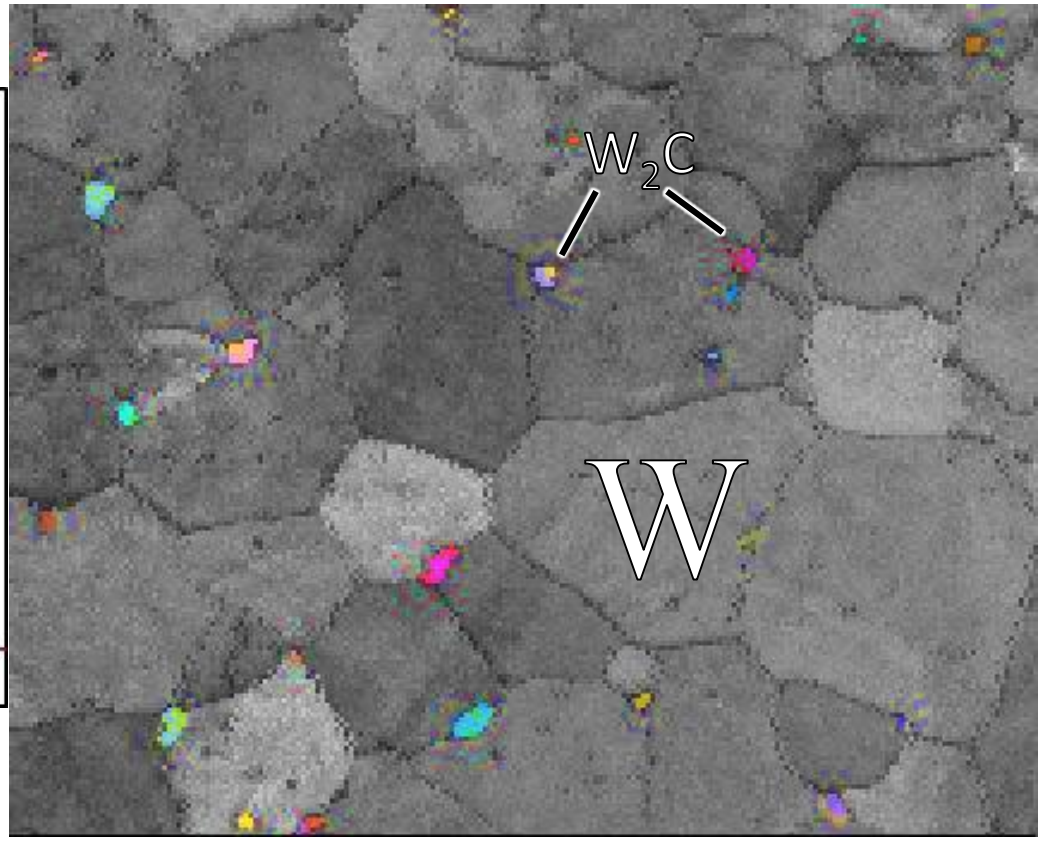












Poster no. 5

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10th and 11th May

In3 project: towards animal-free chemical safety assessment

Liadys Mora Lagares,

National Institute of Chemistry

Poster number: 49

Is it necessary to use animals in research?

- Chemical safety assessment traditionally based on animal testing
- EU promoting the **3Rs**

Reduction:	Any strategy that will result in fewer animals being used in research.
Refinement:	Modification of experimental procedures to minimize pain.
Replacement:	Methods which avoid or replace the use of animals in research.

MSCA-ITN-2016 / grant no. 721975

KEMIJSKI INŠTITUT

in3 integrated in vitro & in silico tools

MARIE CURIE ACTIONS

Why human based models in toxicology?

Animal models

- **Humans are not rats or guinea pigs**
- **Poor prediction of adverse drug reactions** (high rate of false negatives (30 to 50%) and of false positives)
- **Animal tests and human results agree "5%-25% of the time** (According to the former scientific executive of Huntingdon Life Sciences)
- **Too expensive and time consuming**
- **Valid ethical concerns**

Human based *in vitro* and *in silico* models

- **Ethically sound**
- **Cheaper and quicker** (in theory)
- **Accuracy rates of 80 – 85%**

Human skin models outperform animal models for corrosion and irritation (SkinEthic™ RHE1 and epiCS®)

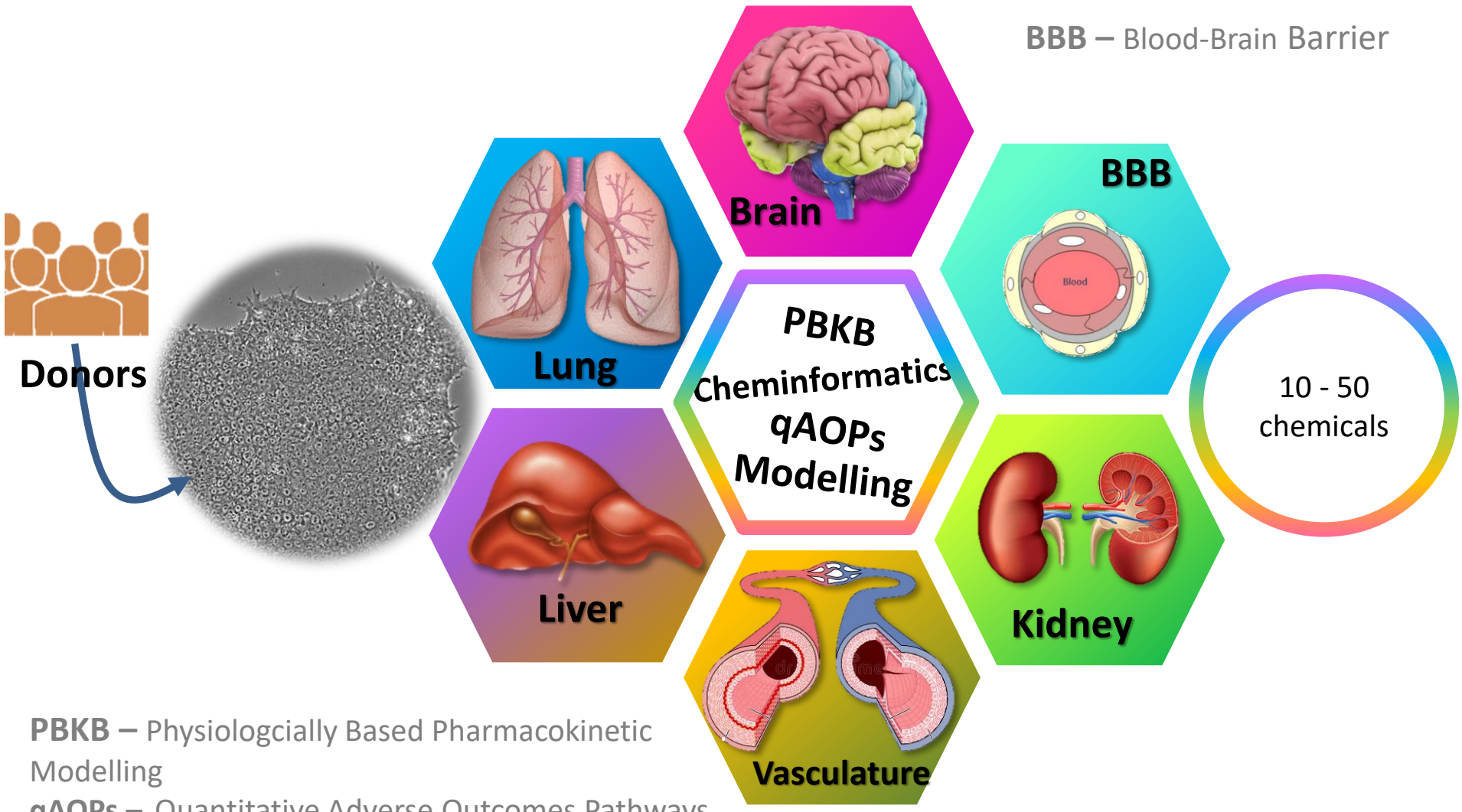
MSCA-ITN-2016 / grant no. 721975

KEMIJSKI INŠTITUT

in3 integrated in vitro & in silico tools

MARIE CURIE ACTIONS

BBB – Blood-Brain Barrier



PBKB – Physiologcially Based Pharmacokinetic Modelling

qAOPs – Quantitative Adverse Outcomes Pathways

MSCA-ITN-2016 / grant no. 721975

KEMIJSKI INŠTITUT

in3 integrated in vitro & in silico tools

MARIE CURIE ACTIONS

Thanks for your attention!

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10th and 11th May

POWERFUL MAGNETS FOR GREEN ENERGY

Matic Korent
Department for Nanostructured Materials
Jožef Stefan Institute
International Postgraduate School Jožef Stefan

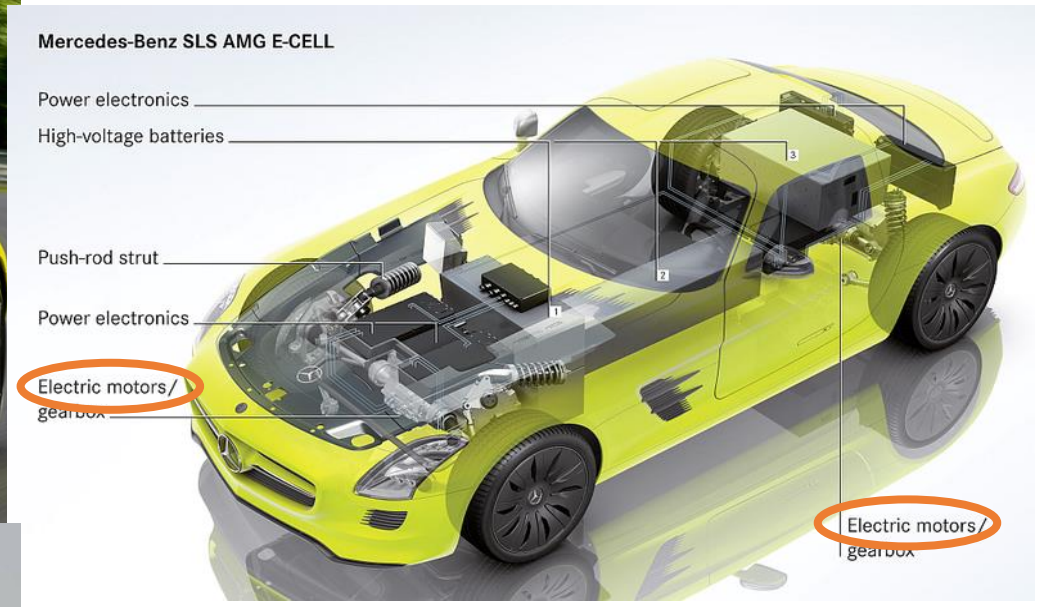
Poster number: 15

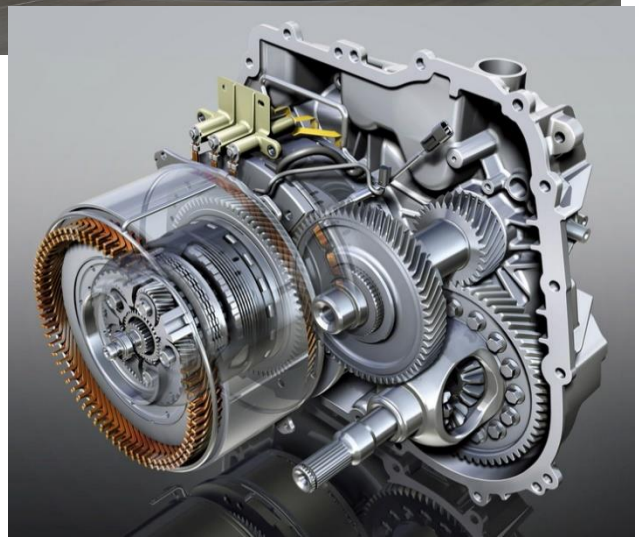
Motivation

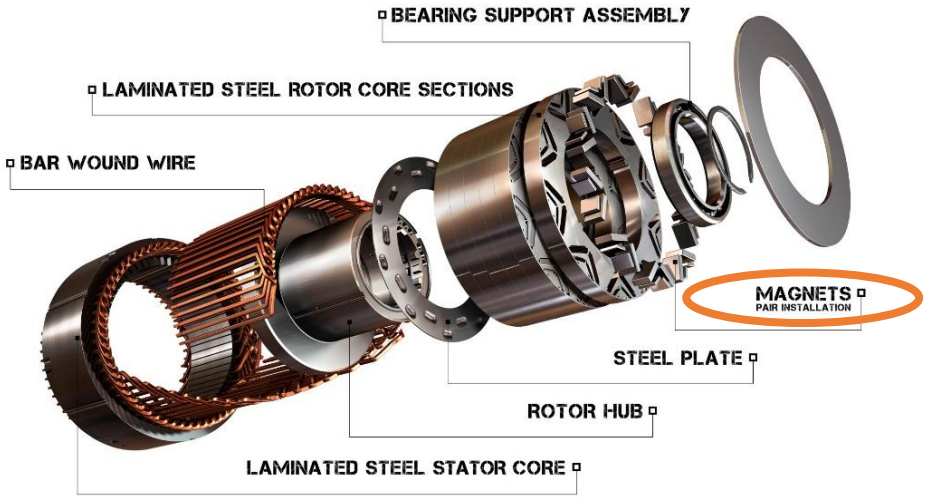
1. *https://gas2.org/2012/03/29/air-pollution-and-your-childs-health/*
2. *https://www.treehugger.com/bikes/steampunk-breathing-bike-beats-beijing-air-pollution-china.html*
3. *http://biology4isc.weebly.com/2-environmental-issues.html*

4. *https://www.digitaltrends.com/cool-tech/wind-turbines-stop-eagles-flying/*
5. *https://smartercharger.com/2013/05/electric-car-development/*
6. *https://mashable.com/2016/08/31/uber-electric-cars-london/#x7ID8vtHJkqA*

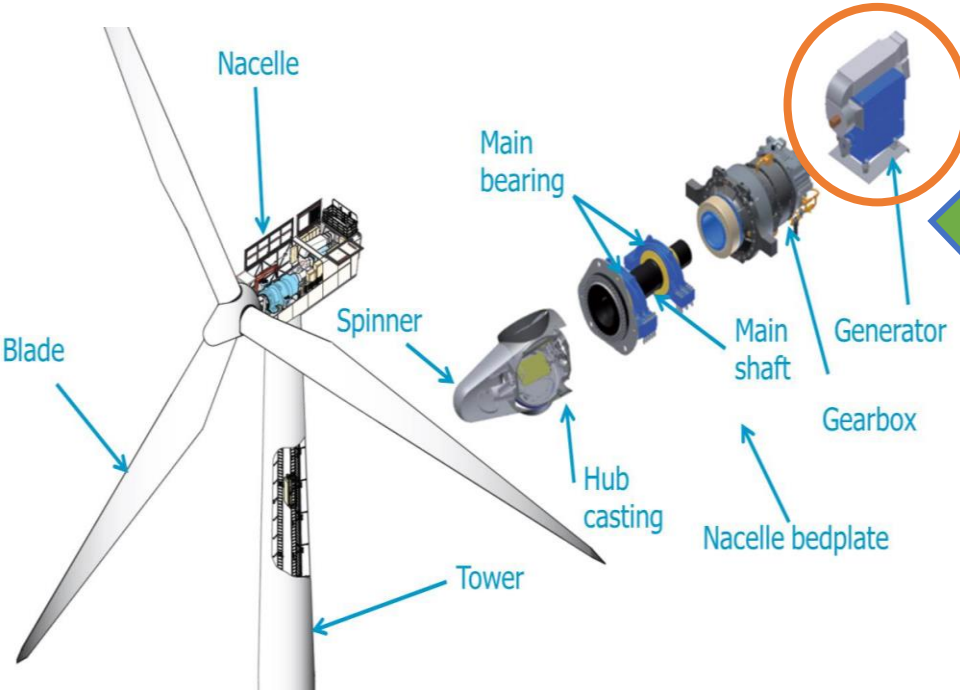
EVERYDAY LIFE

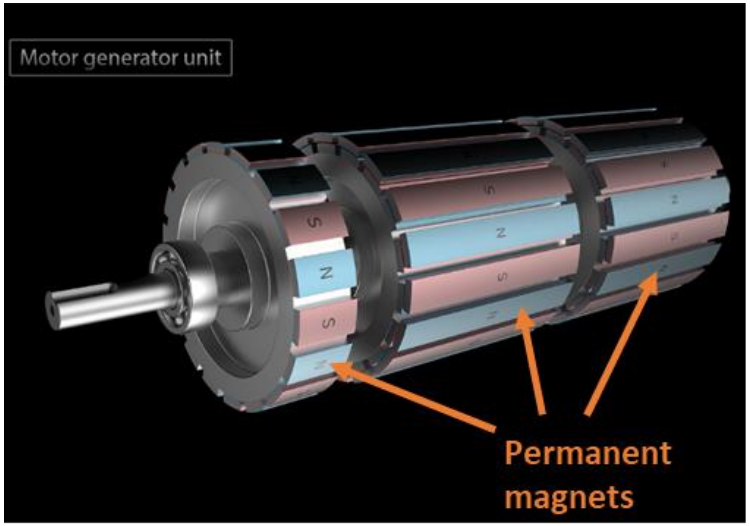






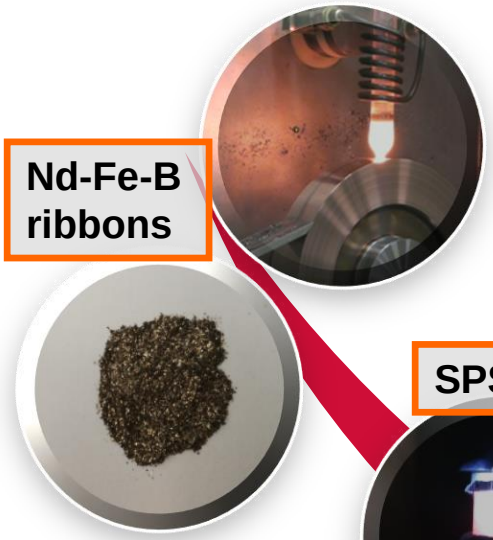
1. http://www.caricos.com/cars/m/mercedes-benz/2014_mercedes-benz_sls_amg_electric_drive/images/41.html
2. https://www.google.si/search?rlz=1C1BLWB_enSI792SI792&biw=192 0&bih=1094&tbm=isch&sa=1&ei=y-fvWp3iKISVsAfMrJCgCQ&q=electric+motor+for+car&oq=electric+motor+&gs_l=img.3.1.0l2j0i30k1l4j0i10i30k1j0i30k1l3.57785.60671.0.64125.15.10.0.5.5.0.91.717.10.10.0....0...1c.1.64.img..0.15.769...0i67k1.0.zNWF30Fd1Hg#imgrc=lSuktpnwOH2REM:
3. http://2.bp.blogspot.com/_fSvarQSvbd0/TDKQt1damVI/AAAAAAA ABl /xBoP4hDKEmk/s1600/SLSecell.png
4. https://www.google.si/search?rlz=1C1BLWB_enSI792SI792&biw=192 0&bih=1094&tbm=isch&sa=1&ei=y-fvWp3iKISVsAfMrJCgCQ&q=electric+motor+for+car&oq=electric+motor+&gs_l=img.3.1.0l2j0i30k1l4j0i10i30k1j0i30k1l3.57785.60671.0.64125.15.10.0.5.5.0.91.717.10.10.0....0...1c.1.64.img..0.15.769...0i67k1.0.zNWF30Fd1Hg#imgrc=lSuktpnwOH2REM:

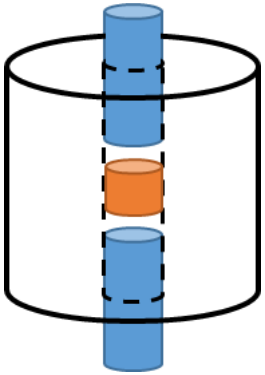


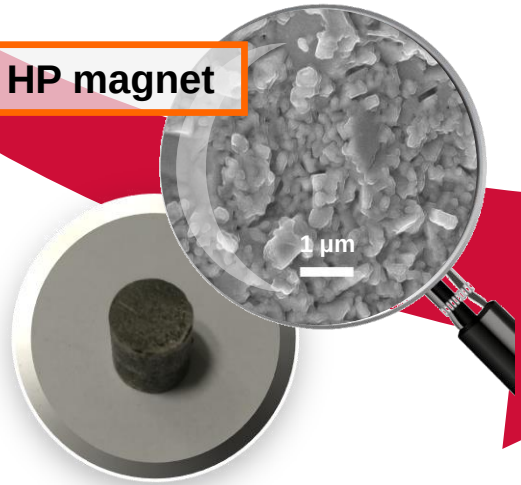


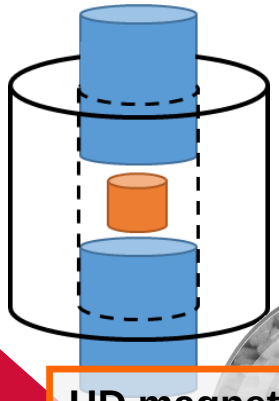
1. https://en.wikipedia.org/wiki/Wind_turbine
2. http://www.kentwindenergy.co.uk/building-wind-farm.php
3. http://new.abb.com/motors-generators/generators/generators-for-wind-turbines/fixed-speed-generators
4. https://www.pinterest.com/pin/649010996272393120/
5. https://www.google.si/search?q=vetrna+elektrarna+slovenija&rlz=1C1BLWB_enSI792SI792&source=lnmsbm=isch&sa=X&ved=0ahUKEwjS2t7JwPPaAhWtMewKHQ4JDZMQ_AUICigB&biw=1920&bih=1094#imgrc=UiOiAGNUcpPg5M:

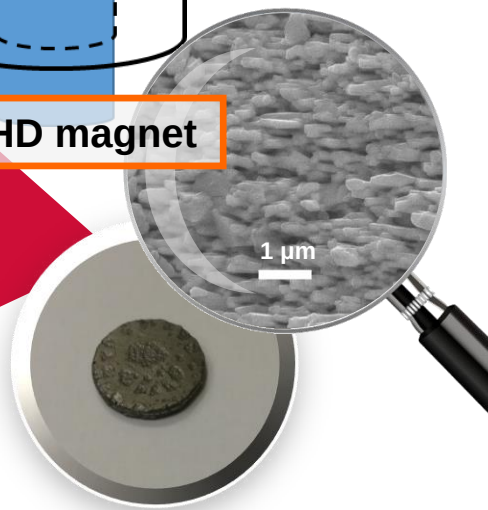
Procedure and results

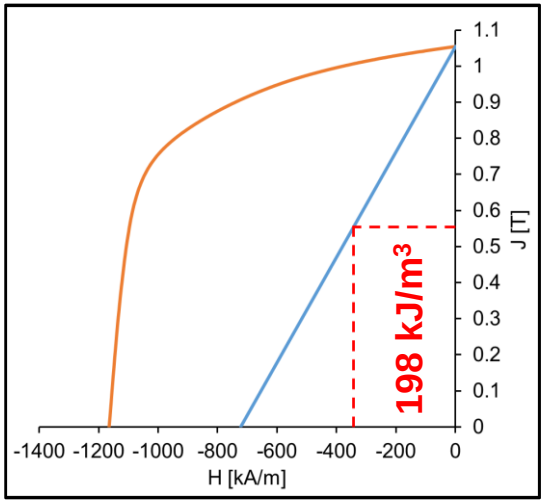


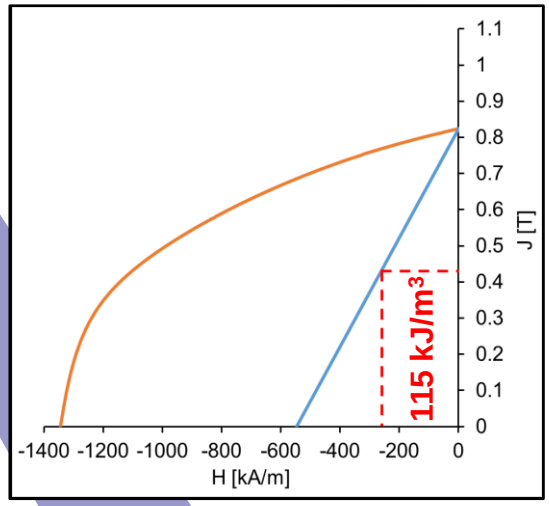












1. http://www.akita-pu.ac.jp/system/mise/material_structure/bitoh/research_e.htm

Conclusion

Studying of microstructure and improvement of magnetic properties

https://reset.org/blog/vehicle-grid-so-wird-das-e-auto-zum-temporaeren-energiespeicher-07052017

Anisotropic nanocrystalline Nd-Fe-B magnets produced by spark plasma sintering

Matic Korent[1, 2], Marko Soderžnik[1], Kristina Žagar Soderžnik[1], Spomenka Kobe[1]

[1] Department for Nanostructured Materials Jožef Stefan Institute, Ljubljana, Slovenia
[2] Jožef Stefan International Postgraduate School, Ljubljana, Slovenia

Program: Nanoscience and Nanotechnologies

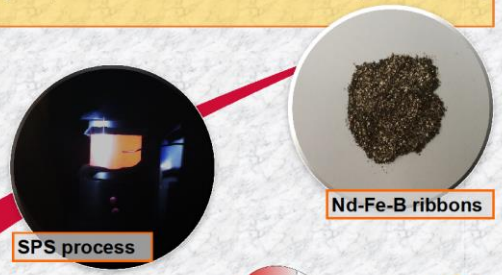
Background

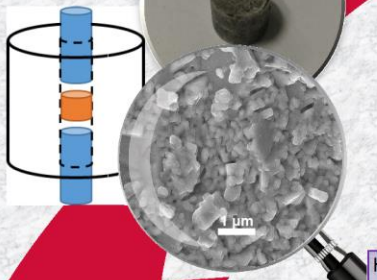
Green technology is an important issue in the direction of preserving and maintaining sustainable environment via wind turbines, electric vehicles and electric generators [1]. For such applications, Nd-Fe-B magnets are the most suitable choice due to their high energy product $(BH)_{max}$. The largest $(BH)_{max}$ value of 433 kJ/m^3 was reported for high-performance anisotropic hot-deformed Nd-Fe-B magnets [2]. However, the coercivity needs to be improved in order to withstand the demagnetization fields during motor operation. Therefore, for achieving magnetic properties of high performance Nd-Fe-B magnets, addition of Nd-based eutectic alloy or/and heavy rare earths (Tb, Dy) needs to be considered.

Aim

- Hot-deformed magnets with the improved magnetic properties.
- Spark plasma sintering (SPS) process (low temperatures and short times).

Technological procedure





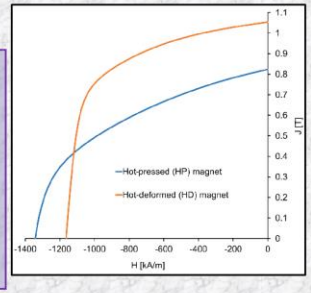
Characterization

- Magnetic measurements with permeagraph at 50°C.
- Microstructural analyses with scanning electron microscope.

Results

Hot-pressed (HP) magnet
- Coercivity: 1343 kA/m
- Remanence: 0.83 T
- $(BH)_{max}$: **115 kJ/m^3**

Hot-deformed magnet (HD)
- Coercivity: 1165 kA/m
- Remanence: 1.06 T
- $(BH)_{max}$: **198 kJ/m^3**



Conclusions

- Remanence of HD magnet enhanced for 28 %, while the coercivity needs to be improved.
- Anisotropic microstructure.
- Future plans: infiltration of Nd-based eutectic alloy.

References

1. High coercivity, anisotropic, heavy rare earth-free Nd-Fe-B by Flash Spark Plasma Sintering. [cited 2018 April 12]; Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5593872/.
2. Saito, T., et al., The development of high performance Nd–Fe–Co–Ga–B die upset magnets. Journal of applied physics, 1998. 83(11): p. 6390–6392.

Acknowledgements

- ARRS – project PR-08336

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10th and 11th May

Graphene – The start of a new technological revolution

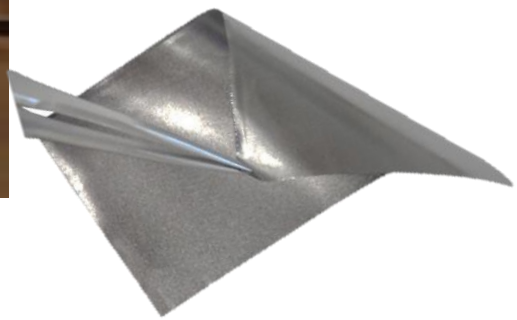
Aswathy Vasudevan

Jožef Stefan International Postgraduate School

Poster number: 11

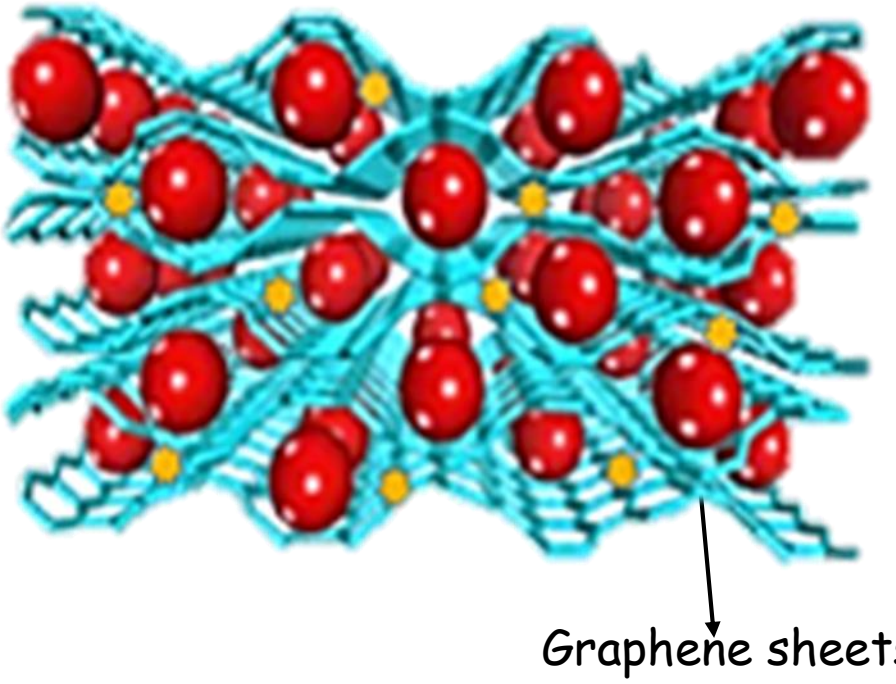
Graphene : A promise for future

- Multifunctionality
- Flexibility and transparency
- Conductive



Combining advantages of materials

Metal oxide anchored graphene/Au NPs hybrid



Au nanoparticles

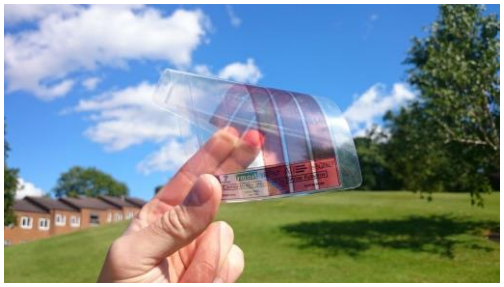
Metal oxide nanoparticles

Applications in energy efficient devices

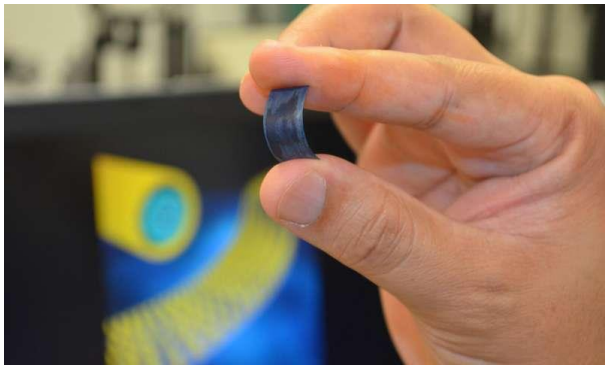
A phone that charges in seconds?

'Moth eyes' to power future smart technologies ?

Batteries



Solar cells



Super capacitors

Thankyou for your attention!

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10th and 11th May

Circulation model of wide-open bays

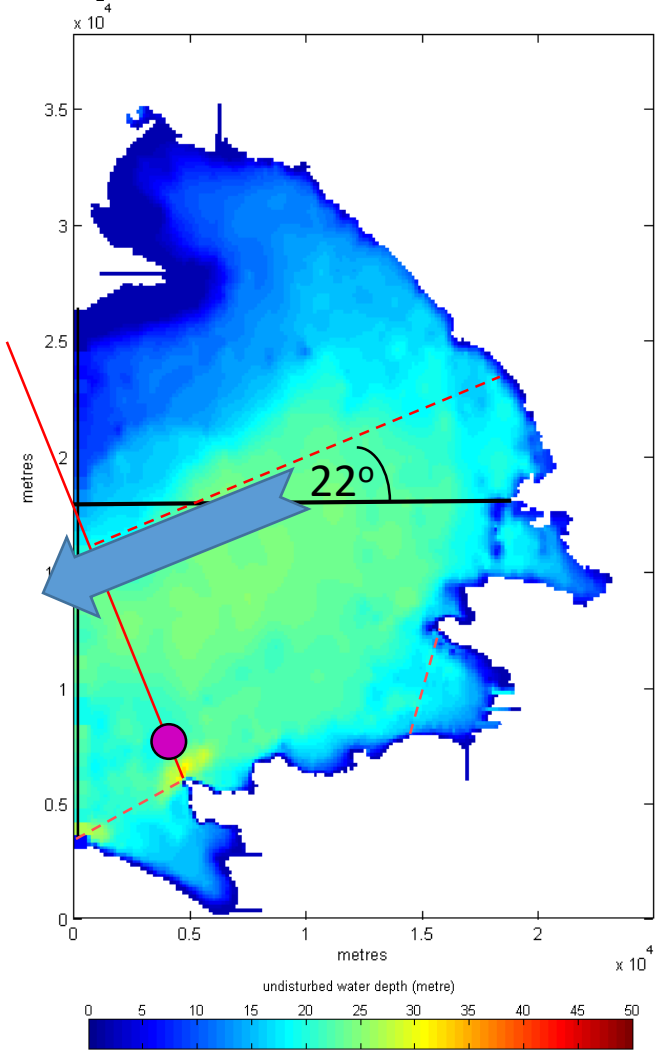
Borut Umer,

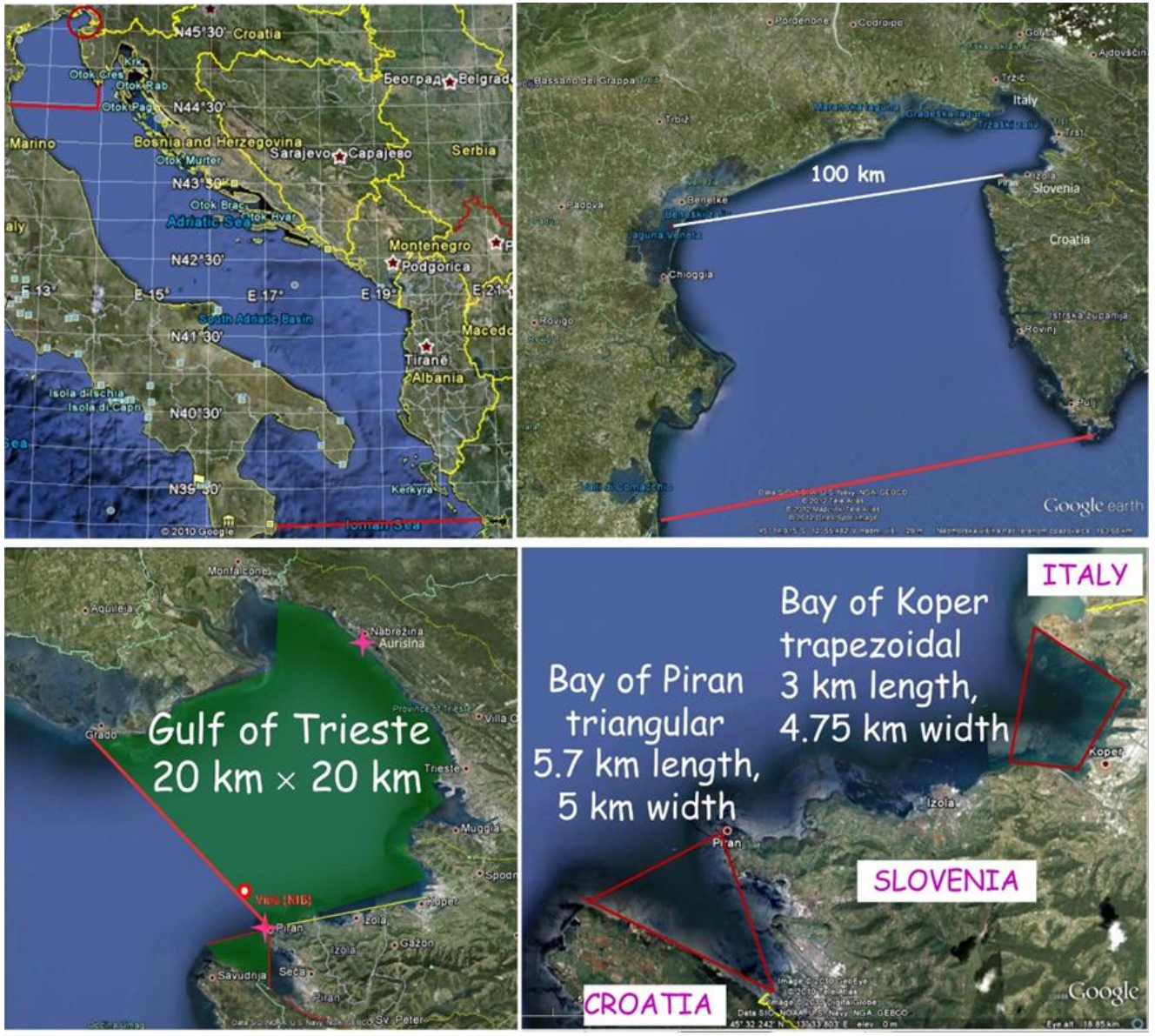
National Institute of Biology, Marine Biology Station Piran

Poster number: 44

Physical oceanography

- Pollutants
- Plastic
- Sediment transport
- Understanding the Sea





- Nucleus for European Modelling of the Ocean (NEMO)

$$\frac{\partial U_h}{\partial t} = -\left[(\nabla \times U)\times U + \frac{1}{2}\nabla(U^2)\right]_h - fk \times U_h - \frac{1}{\rho_0}\nabla_h p + D^U + F^U$$

$$\frac{\partial p}{\partial z} = -\rho g$$

$$\nabla \cdot U = 0$$

$$\frac{\partial T}{\partial t} = -\nabla \cdot (TU) + D^T + F^T$$

$$\frac{\partial S}{\partial t} = -\nabla \cdot (SU) + D^S + F^S$$

$$\rho = \rho(S, T, p)$$

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10th and 11th May

Lipid droplets are targets for reducing cancer resistance to stress

Maida Jusović,
Department of Molecular and Biomedical Sciences

Poster number: 22

Autophagy

- ***For the long period of time, it was thought that the process of autophagy is only the way the cell dies, however, in the last decades, it is understood that this process is very important for prolonging cell survival and for lipid droplets.***
- ***During evolution, organisms have developed unique mechanisms for controlling and responding to changes in the attainability of nutrients.***
- ***Cells adapt to nutrient starvation by shifting their metabolism from reliance on glucose to dependence on mitochondrial fatty acid oxidation.***
- ***Cells store fatty acids in the form of lipid droplets, which have only recently been recognized as organelles.***

Lipid droplets are newly recognized organelles

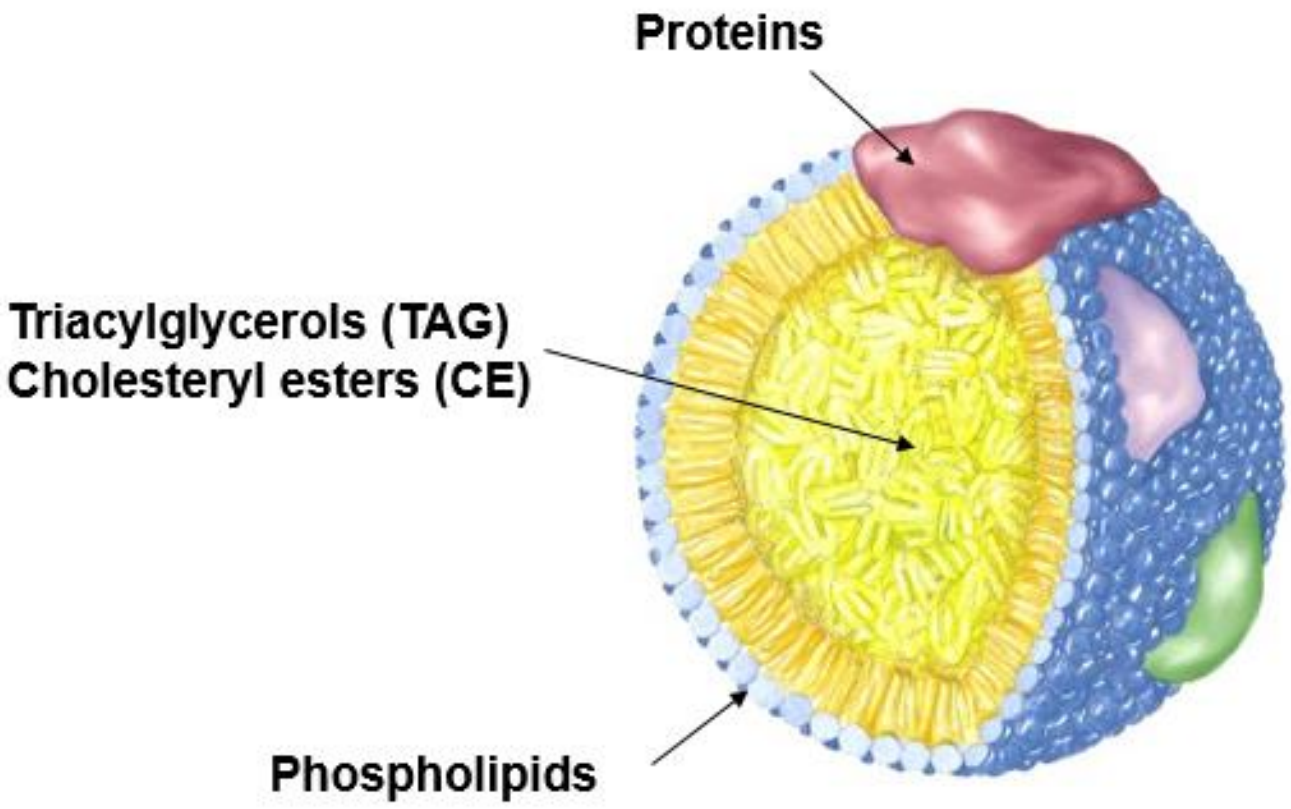


Figure: Anatomy of a lipid droplet. Acquired from: http://www3.mpibpc.mpg.de/groups/jaeckle/pages/Project_Beller/project_Beller.html

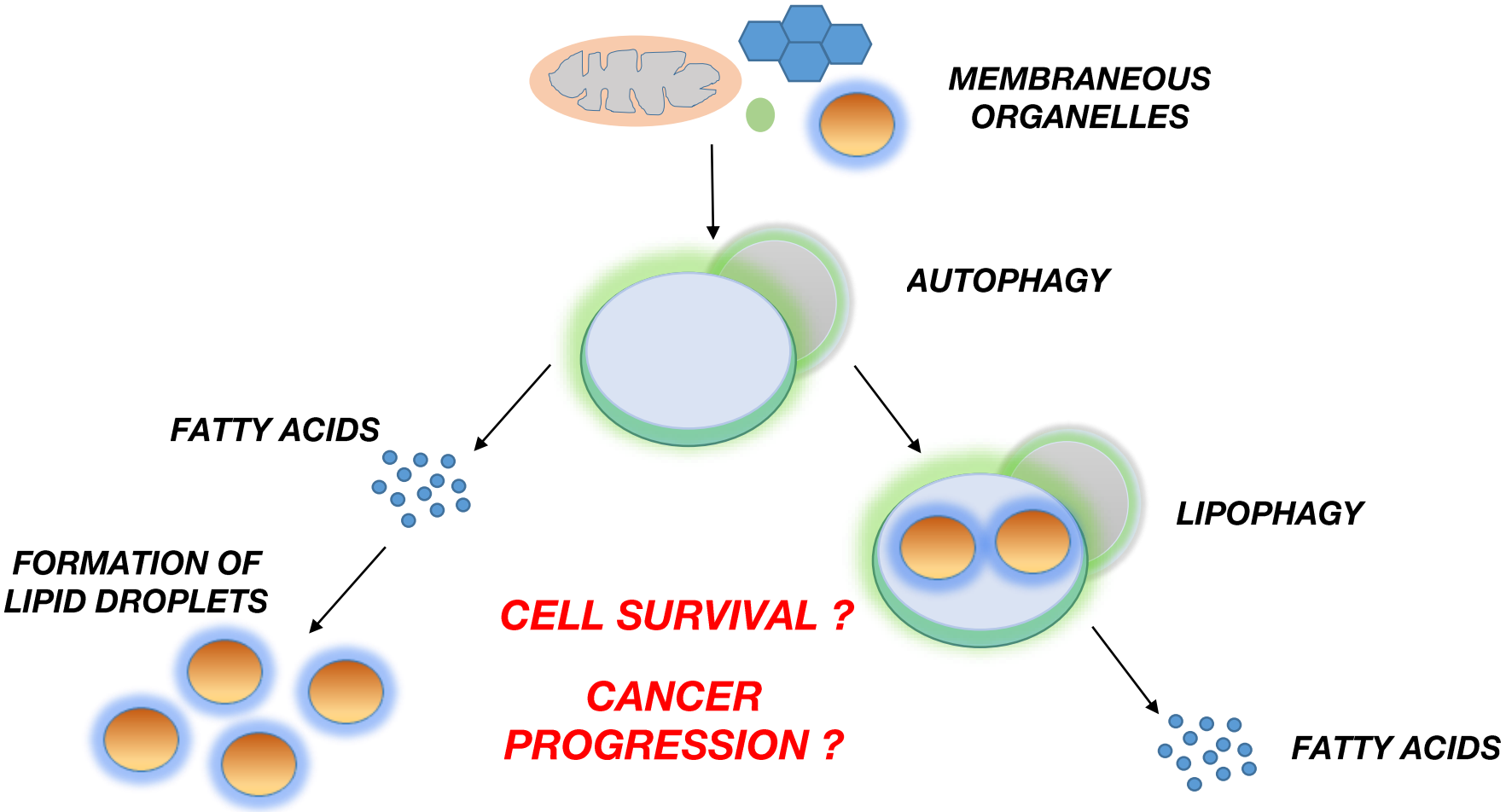
Is autophagy important for lipid droplet biogenesis and function ?

- ***Since fluctuations in nutrient and oxygen availability are characteristic of the tumour environment, cancer cells have developed strategies to overcome these conditions.***

- ***The inability to synthesize their own fatty acids during stress forces cancer cells to scavenge extracellular lipids or to recycle intracellular lipids through autophagy.***

- ***Recent studies suggest that degradation of membranous organelles by autophagy provides fatty acids for lipid droplet biogenesis, whereas lipophagy, a lipid droplet-selective form of autophagy, may also participate in lipid droplet breakdown.***

- ***We have shown that lipid droplets protect breast cancer cells from starvation-induced cell death, but the mechanisms involved are not known.***


MEMBRANEOUS ORGANELLES
AUTOPHAGY
FATTY ACIDS
LIPOPHAGY
FORMATION OF LIPID DROPLETS
CELL SURVIVAL ?
CANCER PROGRESSION ?
FATTY ACIDS

PROJECT GOALS ?

RELATIONSHIP BETWEEN AUTOPHAGY AND LIPID DROPLETS

- ***Analyze the effects on lipid droplet content and cell survival.***
- ***Lipidomic and proteomic analyses.***
- ***Check whether lipid droplets and autophagy are important for tumor growth in vivo.***

Thank you for your attention!☺

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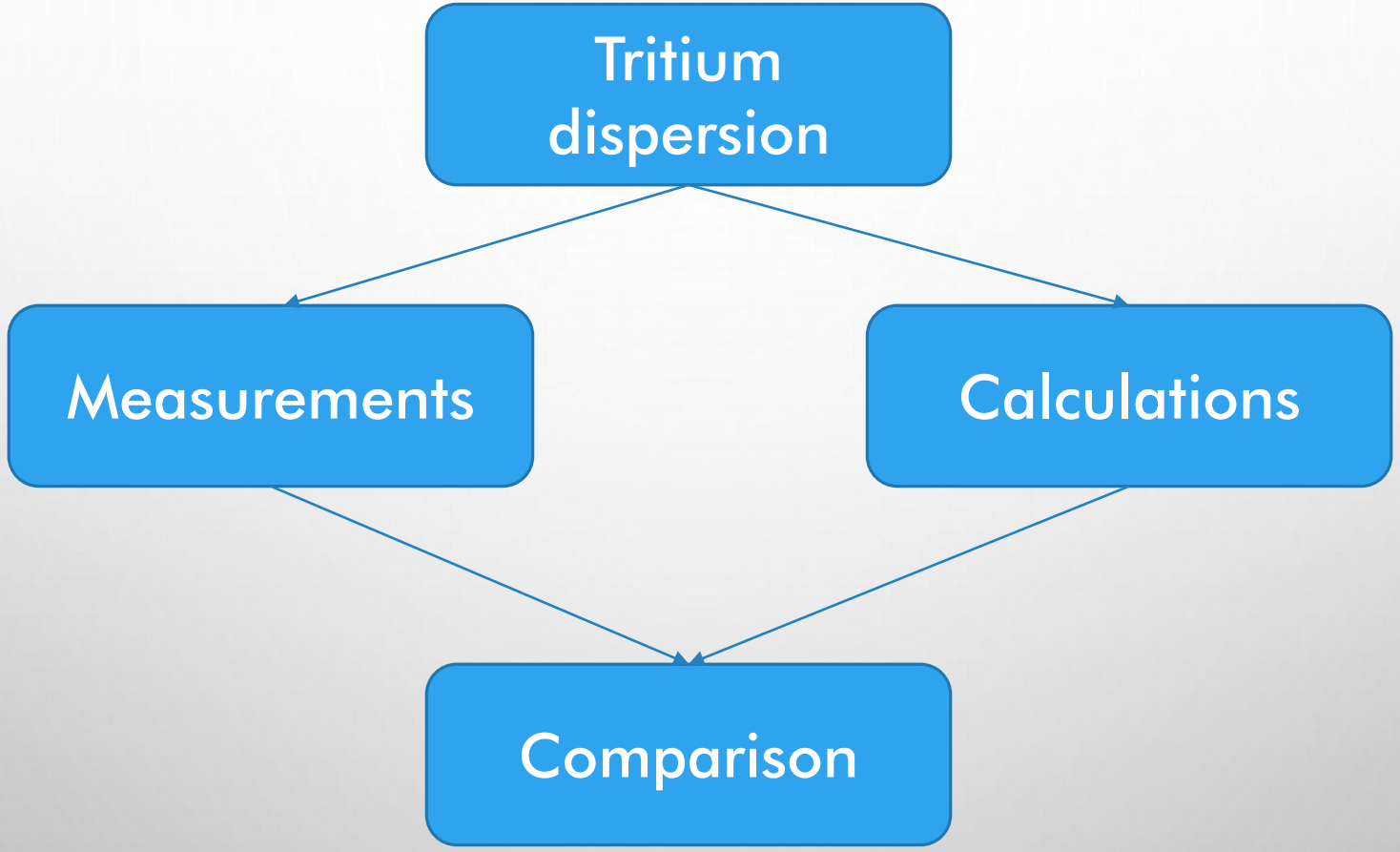
10th and 11th May

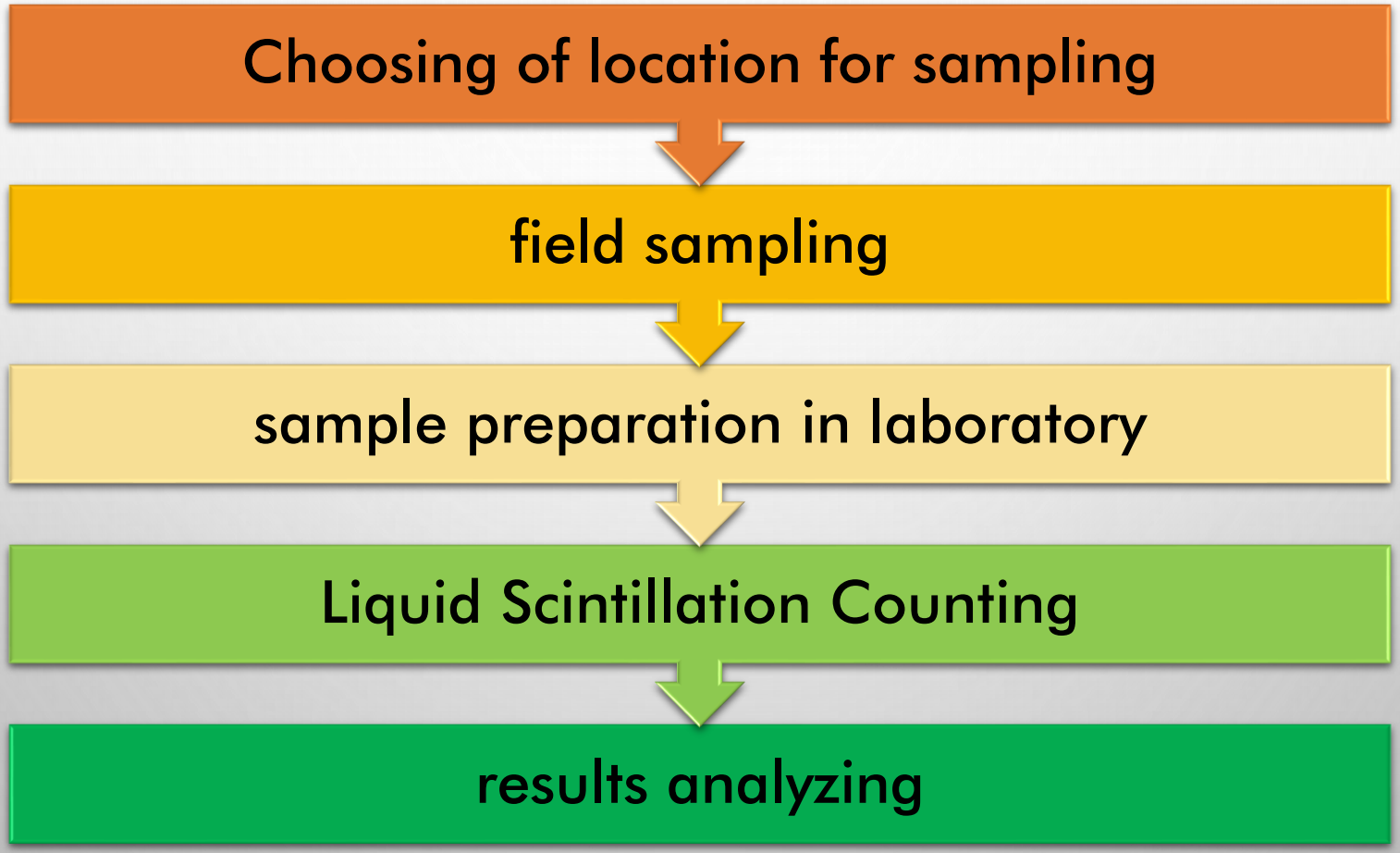
Tritium dispersion around Krško Nuclear Power Plant

Andrii Kholodiuk
Institute for Safety Problems of NPPs, Chornobyl, Ukraine

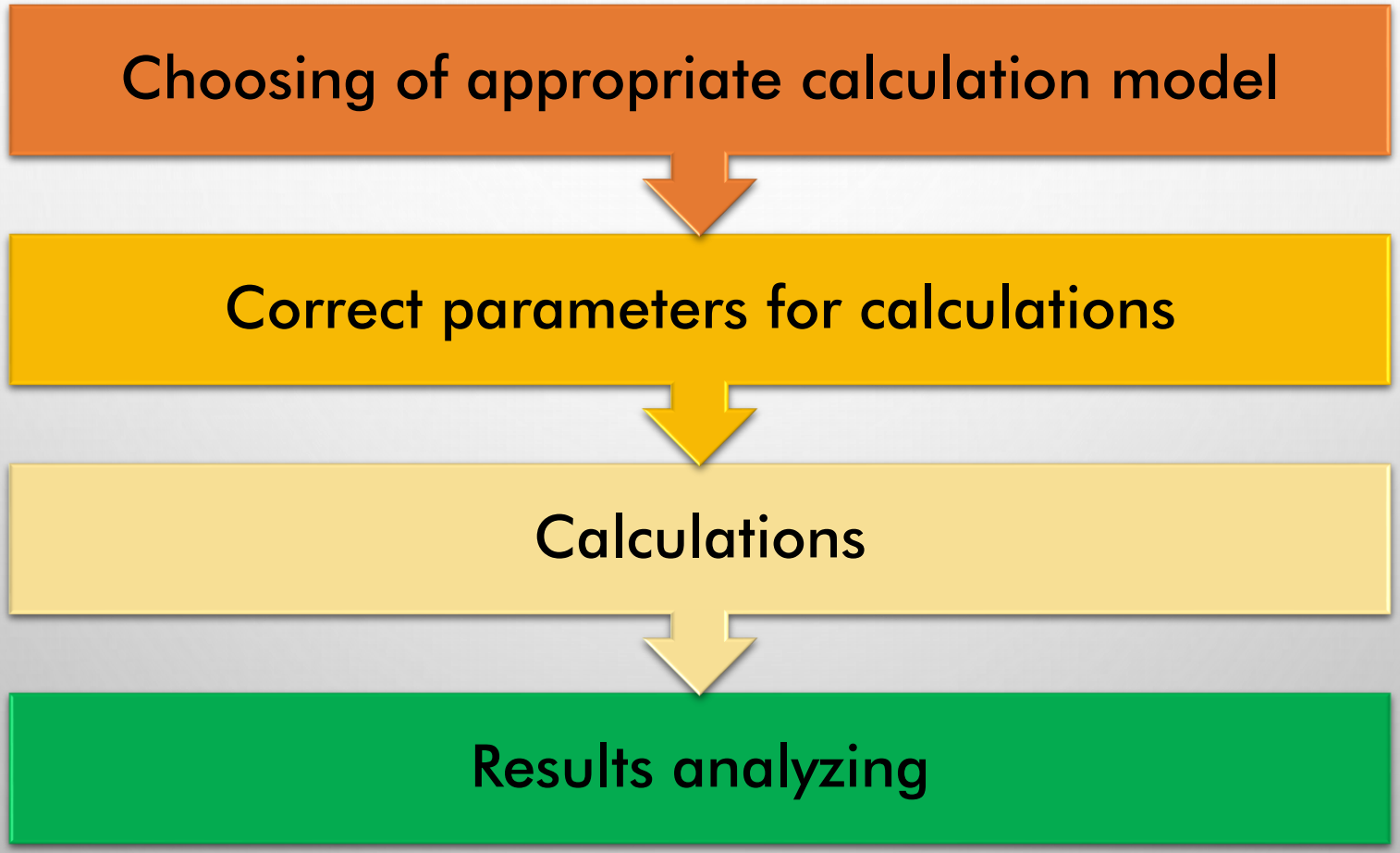
Poster number: 25


Tritium dispersion
Measurements
Calculations
Comparison

TRITIUM MEASUREMENTS



TRITIUM CALCULATIONS



COMPARISON OF CALCULATED AND MEASURED RESULTS

Table shows comparison of measured with modeled data

Sampling date	2.8.2017						
Sampling location	**Measured Value**			**Modeled values**	**χ/Q**	**HTO emission rate (Bq/s)**	**Measured value / modeled value**
	Bq/m^3			Bq/m^3	s/m^3	Bq/s	
Spodnji Stari Grad	8,7E-02	±	1,1E-02	1,4E-01	9,0E-07	1,6E+05	0,6
Krsko	1,7E-02	±	1,4E-03	6,4E-03	4,1E-08		2,7
Gorni Lenart	2,0E-02	±	5,2E-03	2,8E-02	1,8E-07		0,7

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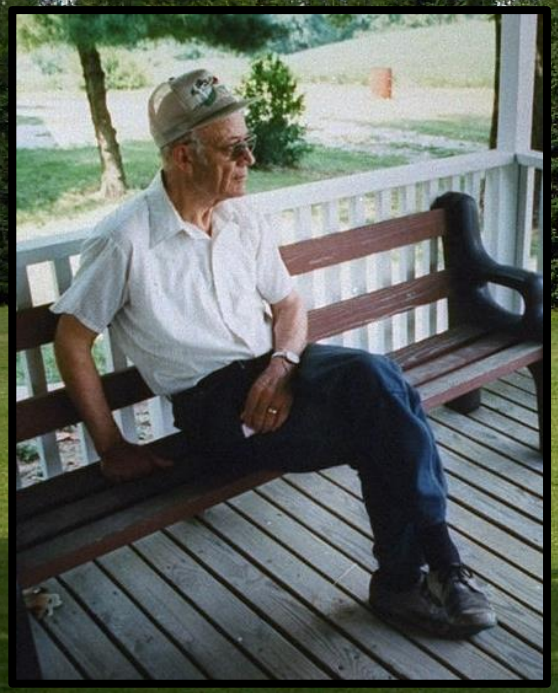
„WHY ARE MY EVERGREENS TURNING BROWN?“

Dona Pavlović

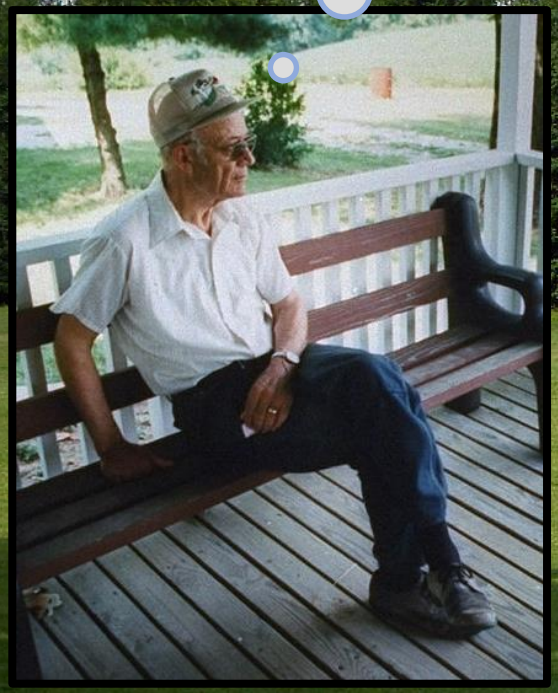
"Jožef Stefan" Institute,

Jožef Stefan International Postgraduate School

Poster number: 13

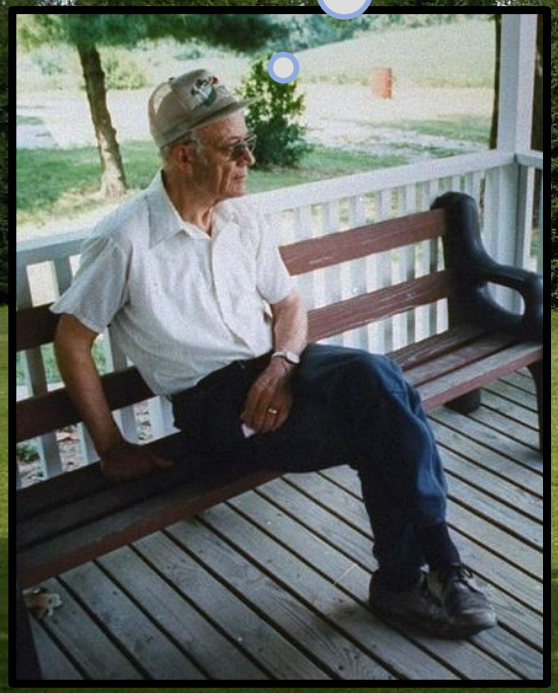


drought
frost
pests
diseases



drought
frost
pests
diseases

pollution ?!?



HF attacks spruce needles causing **NECROSIS**

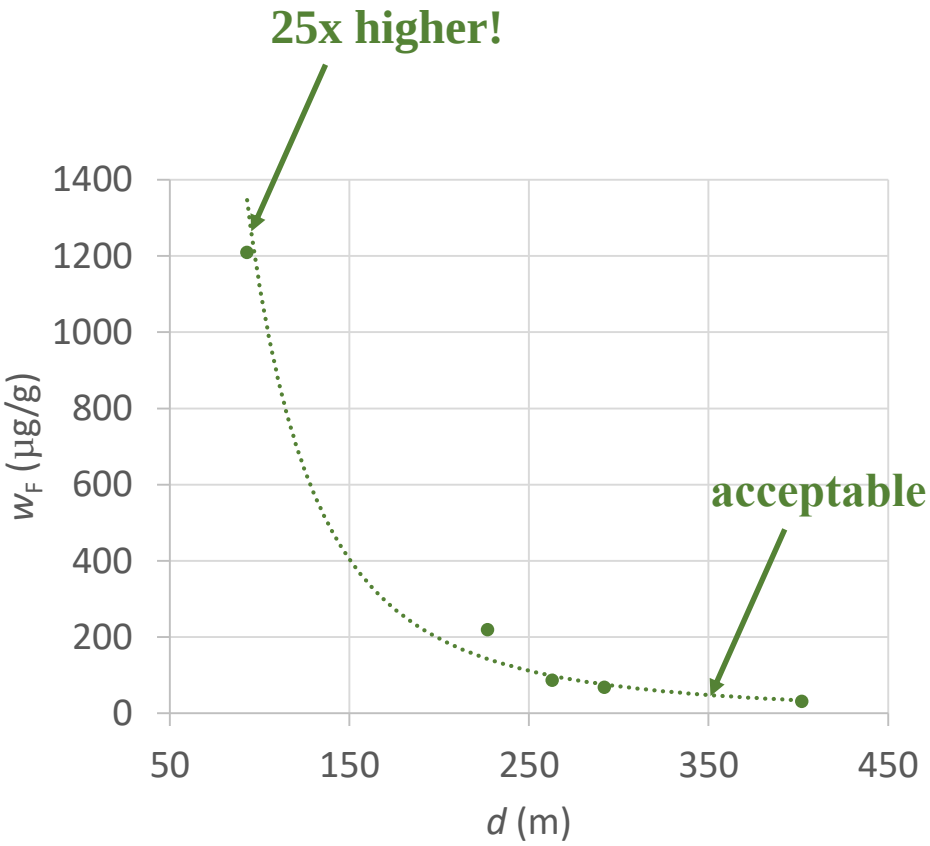
F^-

DETERMINATION OF FLUORINE

Sample	w_F (µg/g)*
Spruce needles, *d* = 93 m	1209 ± 82
Spruce needles, *d* = 227 m	219 ± 28
Spruce needles, *d* = 263 m	87 ± 11
Spruce needles, *d* = 292 m	68 ± 9
Spruce needles, *d* = 402 m	31 ± 9
Spruce needles, background	10 ± 9

*The reported uncertainties are expanded uncertainties calculated using *k* = 1.96, which corresponds to the 95 % level of confidence.

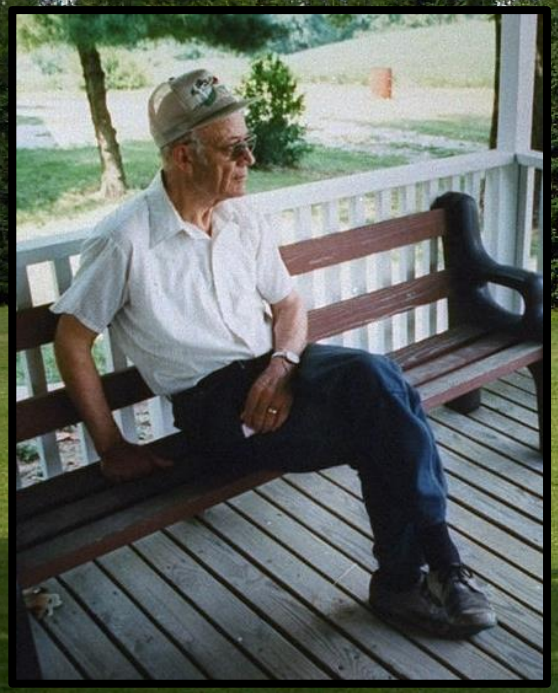
Upper limit for animal consumption is 50 µg/g.



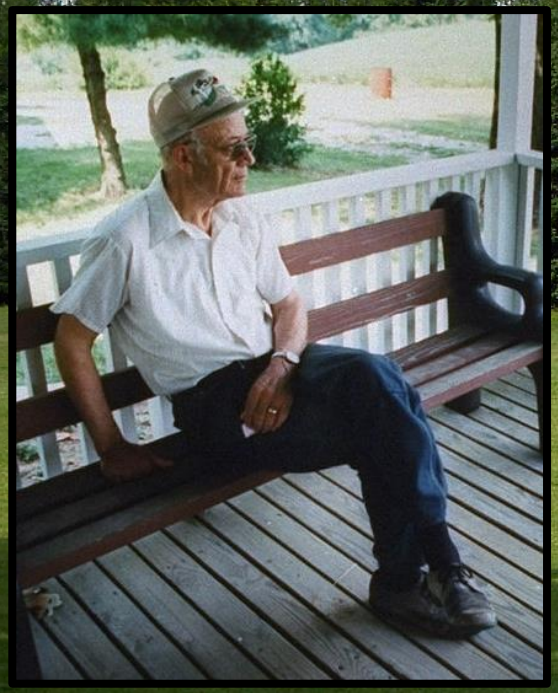
HF

HF

HF



FLUOROSIS



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Biotehniška fakulteta

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Institute of Tajikistan

Investigation of arsenic in contaminated soils in the Mežica valley

Dalerjon Khojiboev[1,4], Peter Stegnar[2], Zafar Razykov[1], Muzafar Yunusov[1], Marko Zupan[3] Helena Grčman[3] and Zdenka Šlejkovec[4]

[1]Mining-metallurgical institute of Tajikistan, Department of Ecology, Buston, Tajikistan

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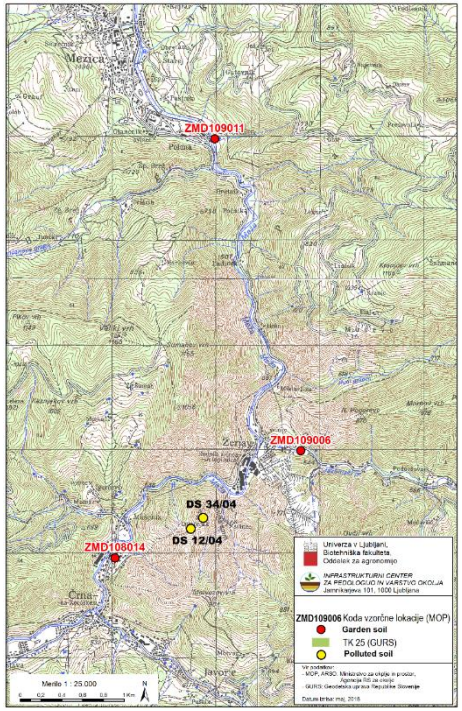

The Mežica valley has been exposed to more than three hundred years of active lead mining and smelting. Soils in the valley, including about 7000 ha of agricultural land, are polluted especially with Pb and Zn, but also with Cd and As.

Location	Code	Sampling date	Type of location	Depth (cm)	Total As (mg/kg)
ZMD108014	1424/16	Sep.16	Vegetable	0-20	16.8
	1425/16		garden	0-20	15.8
ZMD109006	1561/17	Sep.17	Kindergarten -	0-5	12.6
	1562/17		remediated	5-20	12.4
	1563/17			20-30	14
ZMD109011	1574/17	Sep.17	Garden	0-5	11.1
	1575/17			5-20	12.6
DS12/04	B12	Apr.04	Mountain ridge	0-15	224
DS34/04	B34	Apr.04	Mountain ridge	0-15	314
	D34			15-30	nd
	F34			>30	nd

Soil sampling

- top soil samples;
- middle layer;
- and bedrock soil samples were taken at 5 location in Mežica valley

Samples were dried (40-50 °C) for 2 days and sifted to obtain a fraction smaller than 0,25 mm.

Prepared samples were extracted using BCR scheme

Table 1. BCR sequential extraction scheme

STEPS	Fraction targeted	Extractant used
Step1	exchangeable elements and elements bound to carbonate	0.1M CH_3COOH
Step 2	elements bound to iron and manganese oxides (reducible fraction)	0.1M $N_2OH{\cdot}HCl$ in HNO_3 at pH 2
Step 3	elements bound to organic matter and sulphides	30% H_2O_2 and 1M CH_3COONH_4

Arsenic pollution in and around the Mežica valley

- from more or less unpolluted **(< 20 µg g^{-1})** in some garden soils
- to heavily polluted **(> 200 µg g^{-1})** in the top soil on the ridge above Death valley.

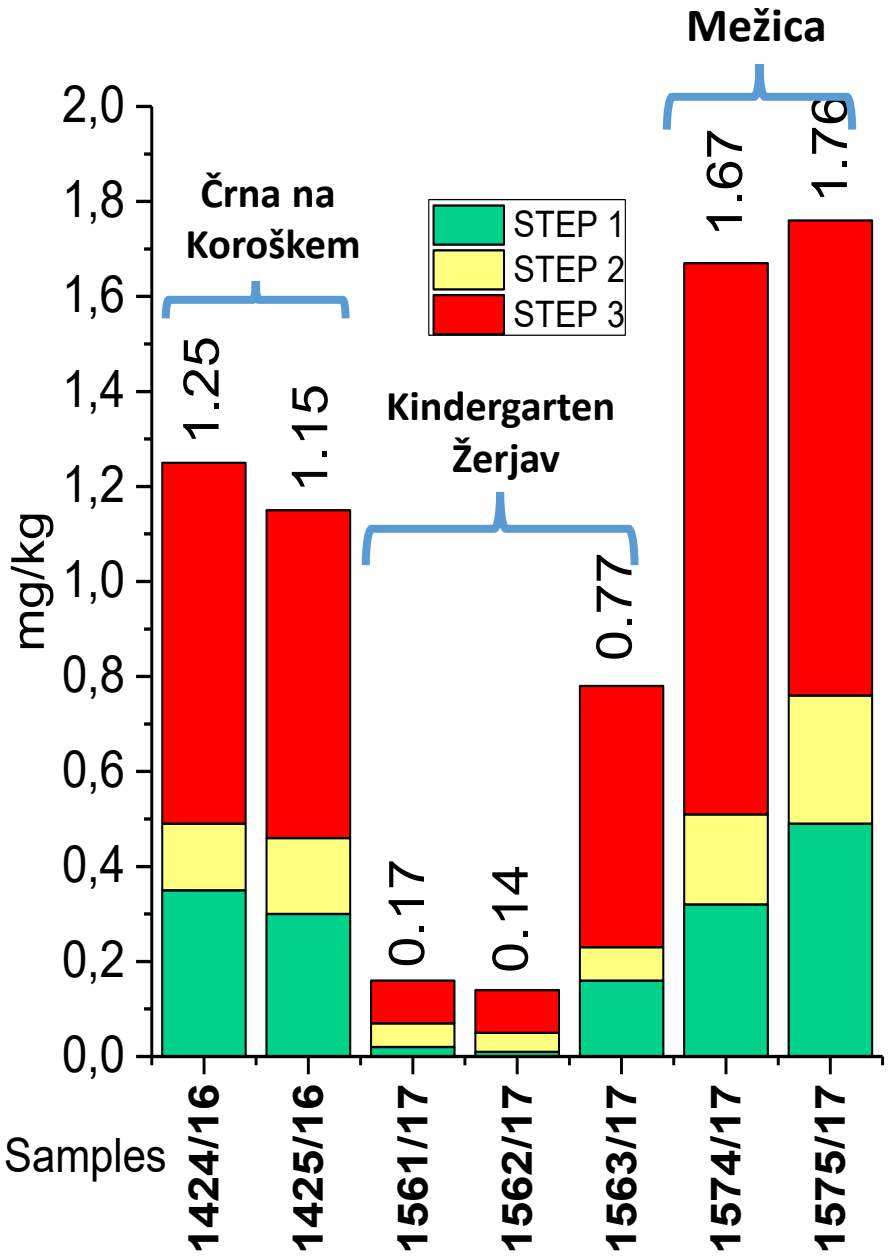

Figure 3: Arsenic extraction from garden soil samples

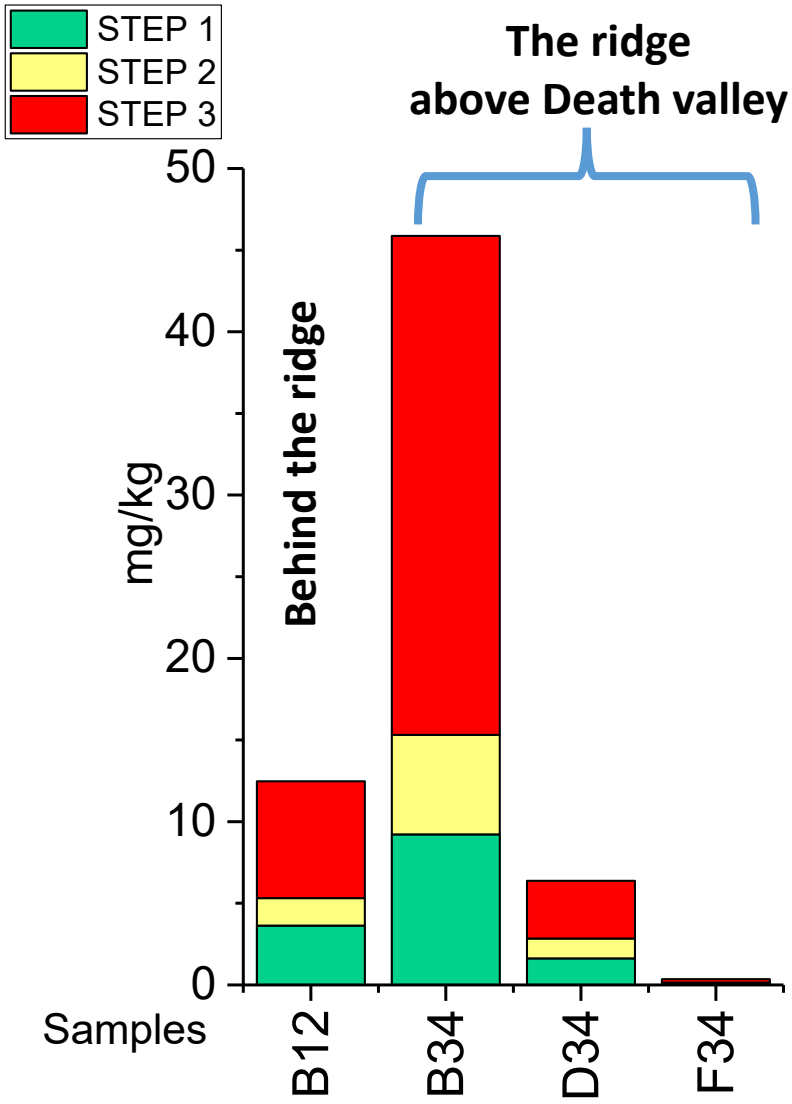

Figure 4: Arsenic extraction from polluted soil samples above the Death valley

As was found in:

- **0.2-4 %** in an exchangeable/ bound to carbonate fraction,
- **0.4-2.1%** in a fraction bound to iron and manganese oxides;
- **0.7-10.5%** attached to organic matter and sulphides.

Major part of arsenic **remained** unextracted, is **not bioavailable** and poses relatively low risk.

The most environmentally mobile is the **exchangeable fraction (extracted in STEP 1),** which also presents the highest potential danger to the environment.

NEXT

- **investigate** this fraction and subject it to determination of inorganic arsenic forms (arsenite and arsenate),
- **study** the extractability and environmental mobility of **lead, zinc and cadmium** in these soils

Thank you
for your attention!

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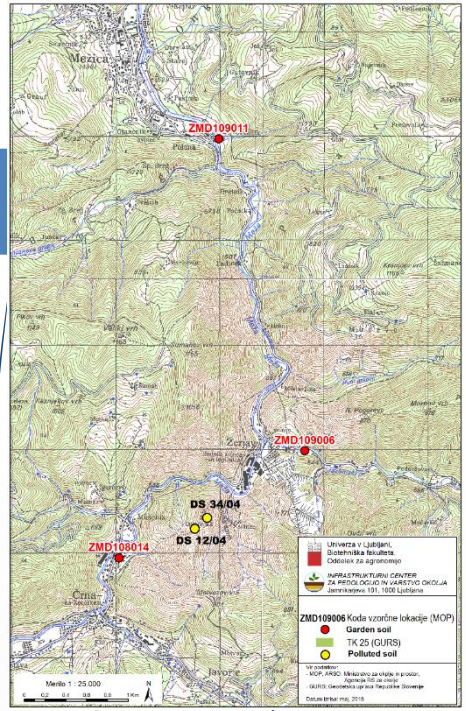

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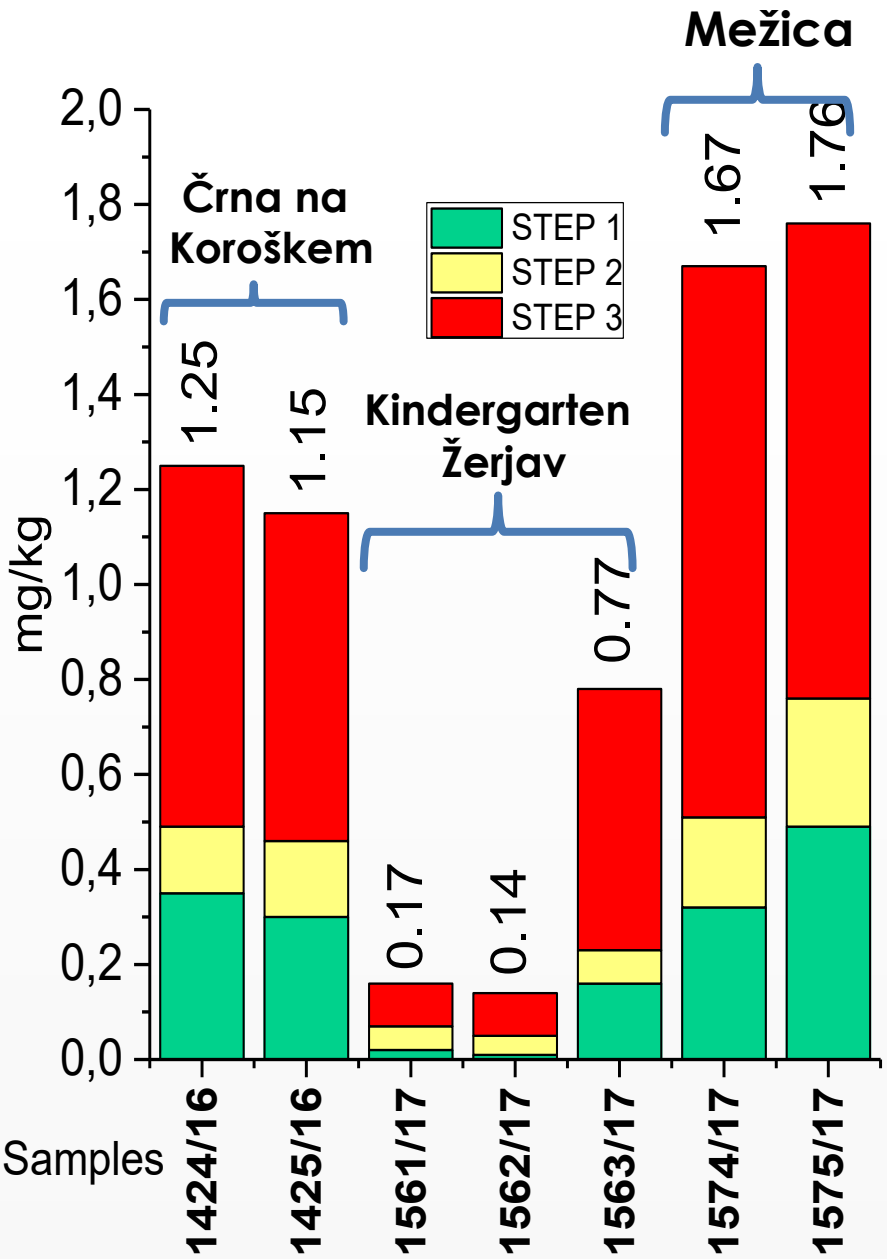

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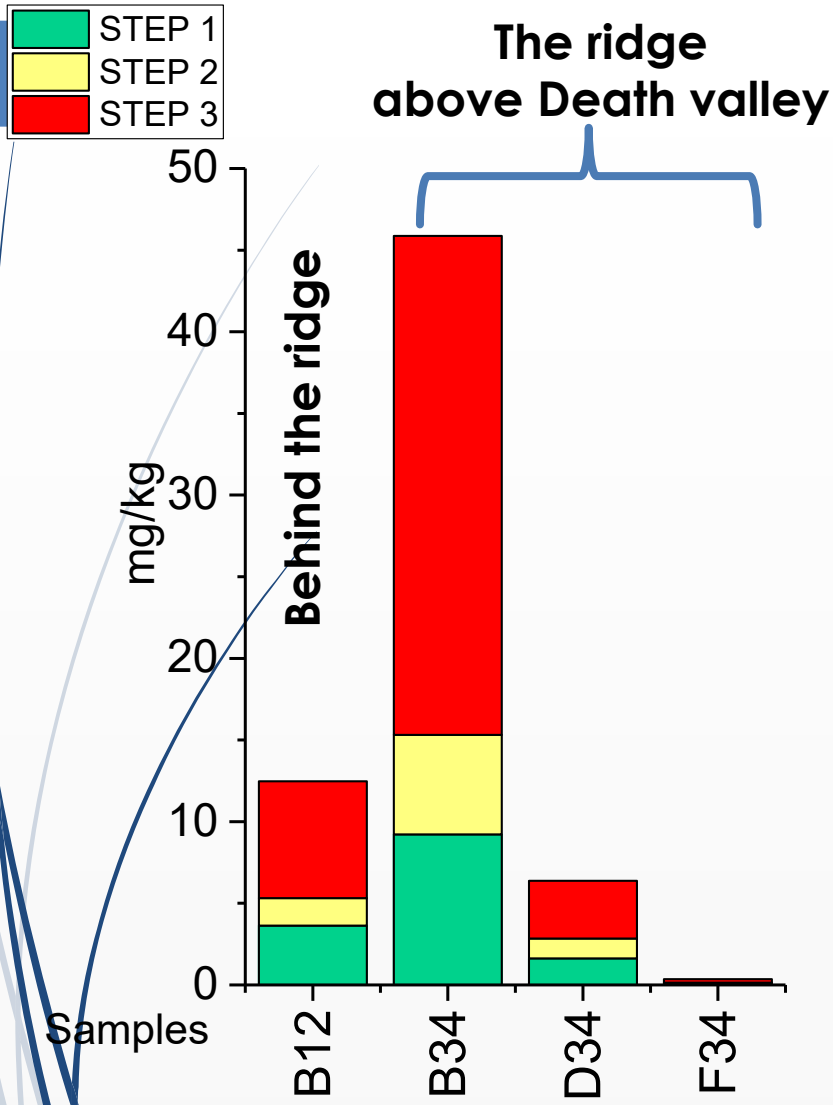

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Thank you
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10th and 11th May

From RNA to dementia and muscle wasting

Mirjana Malnar

Department of Biotechnology, Jožef Stefan Institute, Ljubljana, Slovenia

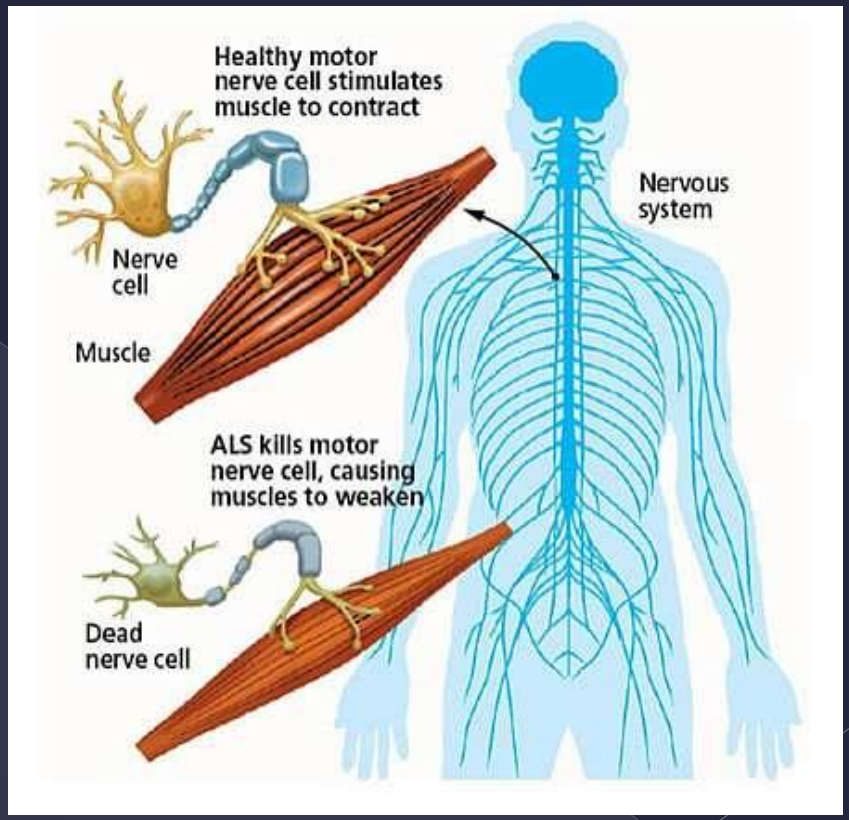
Faculty of Medicine, Ljubljana, Slovenia

Biomedicine, mentor : Boris Rogelj

Poster number: 45

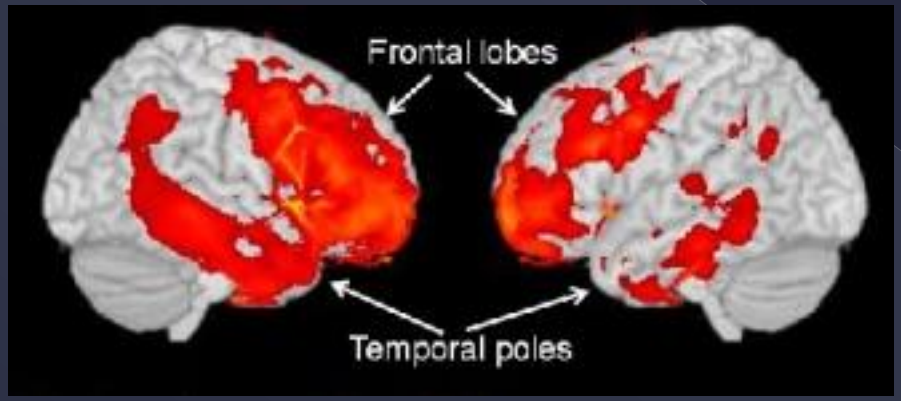
ALS

- ALS – Amyotrophic Lateral Sclerosis
- most common motor neuron disease
  - 1-2:100 000
  - age of onset ~55
- muscle atrophy
- respiratory failure
- ~3 years
- no cure



(Medical Xpress, ALS Foundation for Life, 2018)

FTD

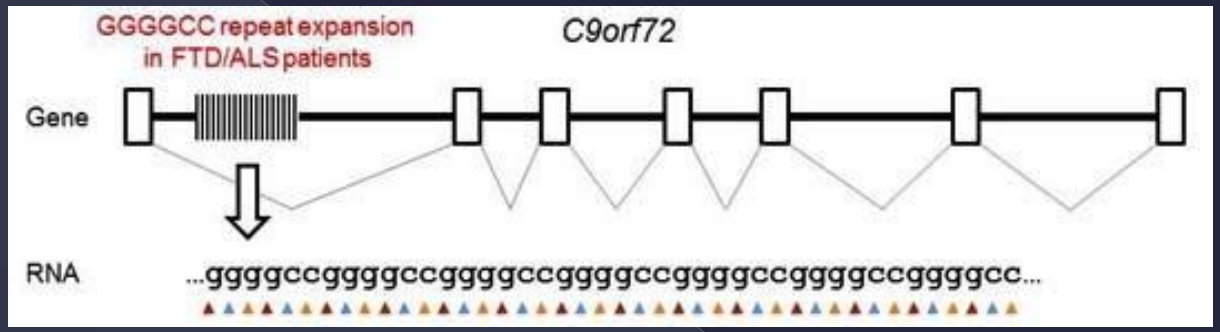


(HVNN, 2015)

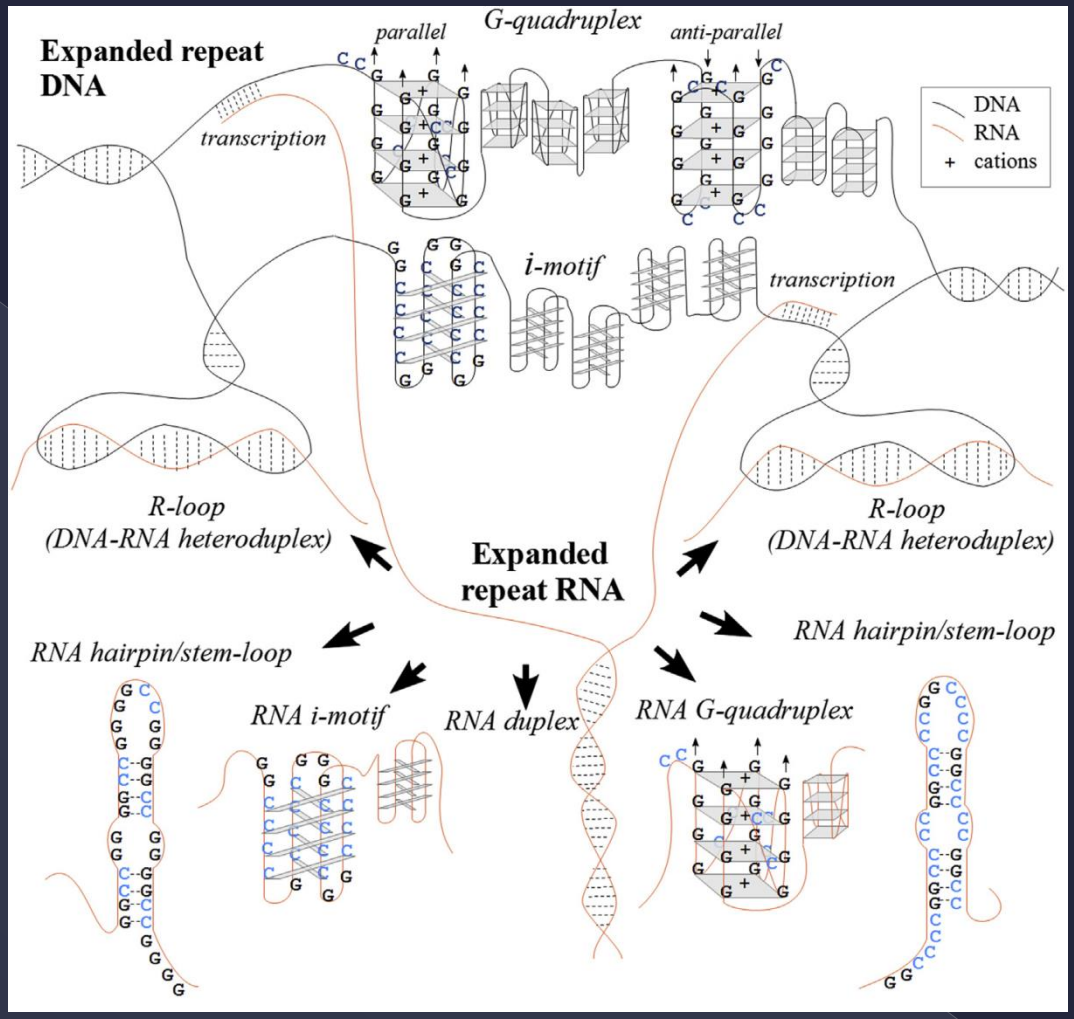
- FTD – Frontotemporal Dementia
- second most common dementia
  - 15: 100 000
  - 45-64 years
- frontotemporal lobar degeneration
- pneumonia
- 3 – 10 years
- no cure

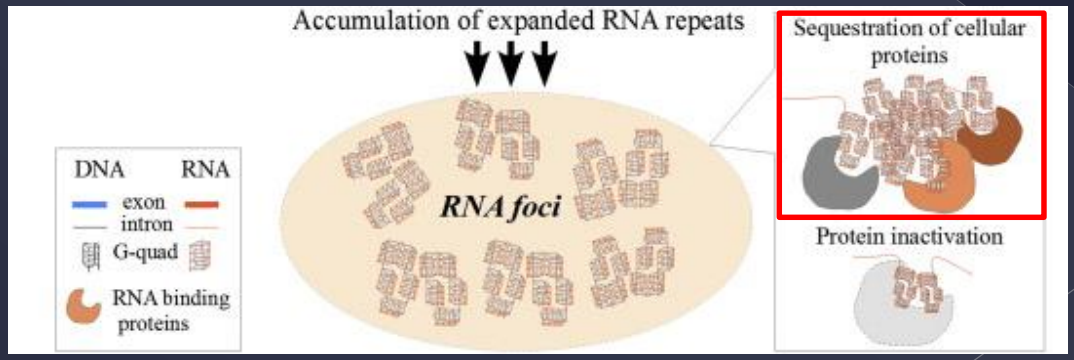
Gene C9orf72

- mutation



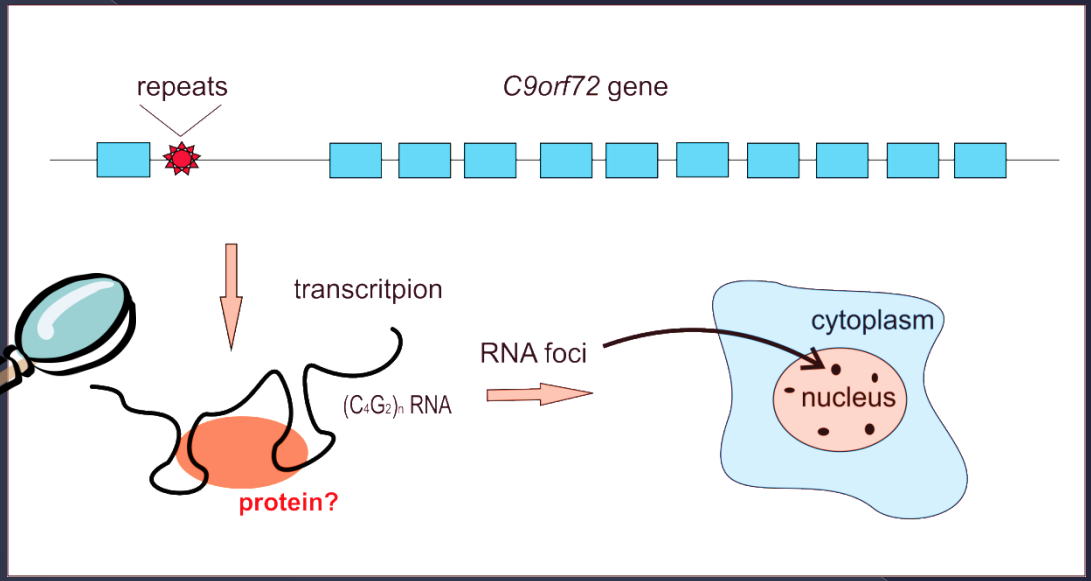
(Mori, 2013)





(Vatovec *et al.*, 2014)

My research project question – see poster 45



Summary

- Incurable neurodegenerative diseases : ALS and FTD
- Impact of *C9orf72* mutation

THANK YOU FOR YOUR ATTENTION!

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10th and 11th May

Digital security in microfinance institutions

Eleonora Zgonjanin Petrovikj,

Jozef Stefan International postgraduate school

Supervisor

Prof.dr.Borka Jerman-Blažič

Laboratory for Open systems and Networks Jožef Stefan Institute and Faculty of Economics, Ljubljana University Slovenia

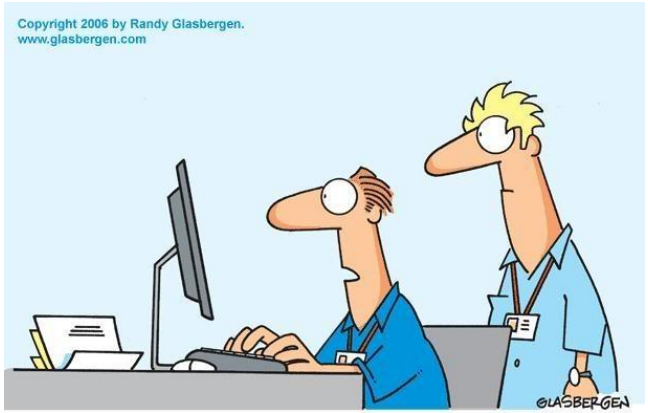
Poster number: 26

WHAT

Awareness, benefits and challenges of digital security (DS)

WHOM

microfinance non-banking financial institutions (MFI).



"Information security is a major priority at this company.
We've done a lot of stupid things we'd like to keep secret."

WHERE

Republic of Macedonia, Greece, Bosna and Hercegovina, Serbia and Albania (selected countries).

Selected countries would be further determinate

HOW

mix of self-respond questionnaires and interviews with executives responsible for digital security

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WHY

Potential findings :

the level of **awareness and knowledge** of the executives for DS
"proportional" level of DS as a regulatory requirement or to "protect" MFIs.
inappropriate planned changes in DS
NOT enough **trained staff**
LACK of **competitive packages** for hiring IT specialists

Thank you

Eleonora Zgonjanin Petrovikj
ezgonjanin@fulm.com.mk