



Transfer of own experiences - mentoring doctoral students employed in the industrial sector



PhD Jagoda Šušković, Full Professor
PhD Blaženka Kos, Full Professor
PhD Jasna Novak, Full Professor
PhD Andreja Leboš Pavunc, Assistant Professor
Martina Banić, mag. ing. biotechn.
Katarina Butorac, mag. ing. biotechn.
Nina Čuljak, mag. ing. biotechn.



Laboratory for Antibiotic, Enzyme, Probiotic and Starter Cultures Technology

February, 5th 2021



Laboratory for Antibiotic, Enzyme, Probiotic and Starter Cultures Technology

- ▶ PhD Jelena Obad (Belupo d.d.): Potential of antimicrobial action of selected active substances in pharmaceutical preparations not containing antibiotics (mentor: prof. Jagoda Šušković)
- ▶ PhD Marija Carić (Kraš d.d.): Effect of probiotics and prebiotics on functional properties of dark and milk chocolate (mentor: prof. Jagoda Šušković)
- ▶ PhD Milica Gačić (CKN): Multi-screening approach to monitor and quantify some antibiotic residues in honey and the kinetic of degradation at various storage conditions (mentor: prof. Jagoda Šušković)
- ▶ PhD Božica Solomun Kolanović (HVI): elimination of levamisole residues from tissues and eggs after oral administration to laying hens and development of LC-MS/MS method for levamisole quantification (mentor: prof. Blaženka Kos)
- ▶ PhD Ivana Varenina (HVI): Distribution and elimination of mandaramicin in eggs after oral administration to laying hens and LC/MS method development for determination of mandaramicin (mentor: prof. Blaženka Kos)
- ▶ PhD Gordana Hajduk (Podravka d.d.): Synbiotic effect of probiotic strain *Bidifobacterium animalis* subsp. *lactis* BB-12 and inulin in dehydrated wheat grits cereal flakes (mentor: prof. Blaženka Kos)
- ▶ MSc Marina Špoljarec (Prehrana d.o.o.): Application of *Lactobacillus plantarum* L4 and *Leuconostoc mesenteroides* LMG 7954 in the production of sauerkraut (mentor: prof. Blaženka Kos)
- ▶ MSc Katarina Tonković (Probiotik d.o.o.): Influence of the probiotic strains, inulin and transglutaminase on the properties of set style yoghurt (mentor: prof. Blaženka Kos)
- ▶ MSc Željka Haramija (Jamnica d.d.): Growth of acidothermophilic spore forming bacteria from the genus *Alicyclobacillus* in fruit juices (mentor: prof. Blaženka Kos)



PROBIOTIK



You have already heard...

- ▶ Healthy interaction between mentor and student
 - ▶ good **communication**
 - ▶ clear understanding of roles
 - ▶ trust
 - ▶ defined expectations of both sides
 - ▶ set goals and time frames
 - ▶ get acquainted with the regulations



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Industry + research =

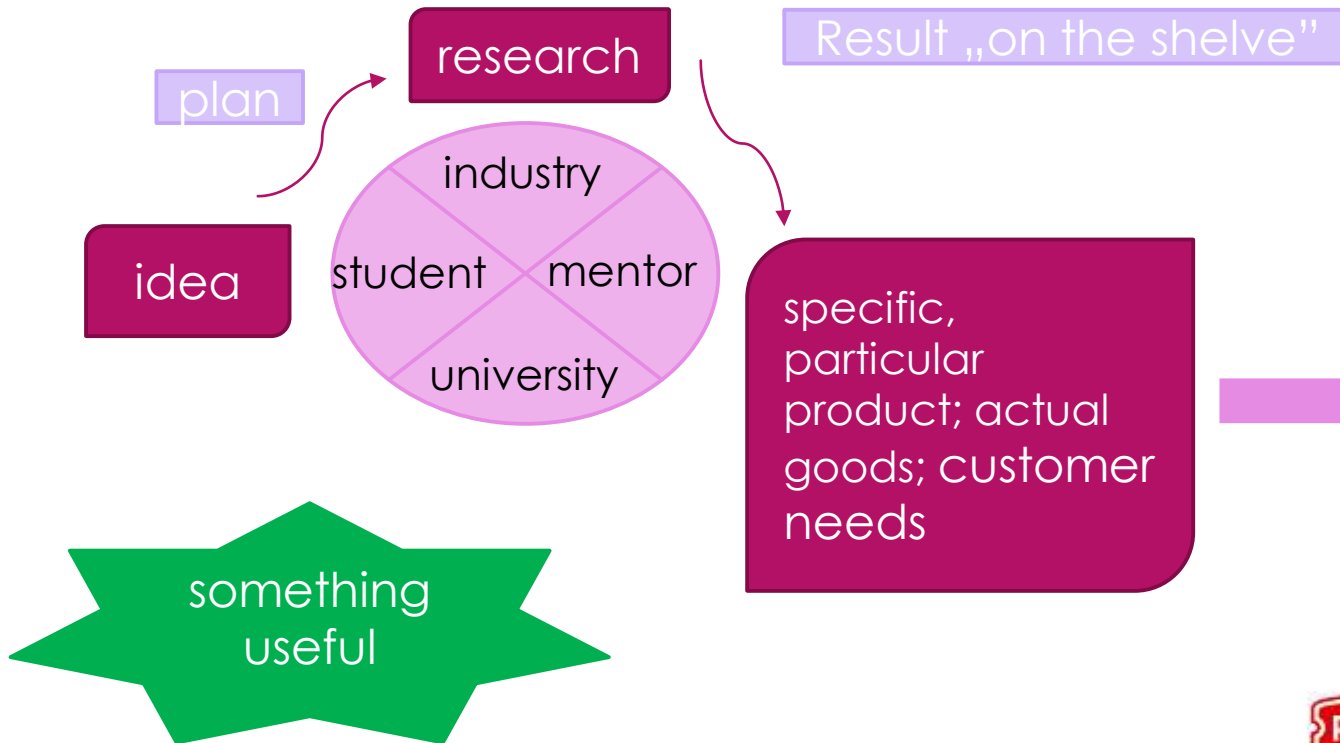


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applicability

Result „on the shelve”

PhD Gordana Hajduk (Podravka d.d.): Synbiotic effect of probiotic strain *Bidifobacterium animalis* subsp. *lactis* BB-12 and inulin in dehydrated wheat grits cereal flakes



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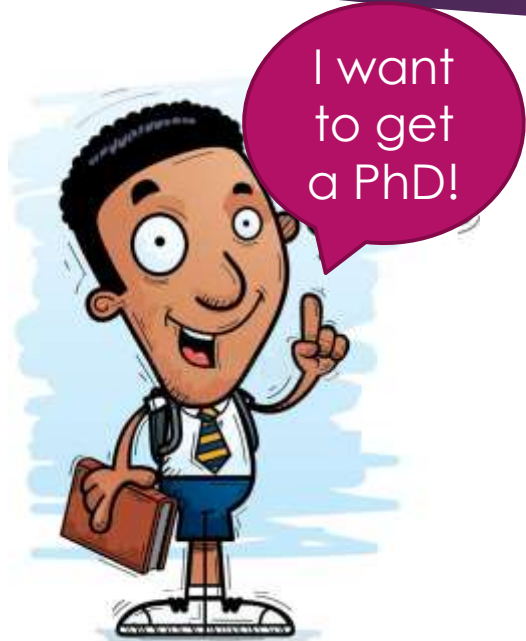
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But....every



has two sides

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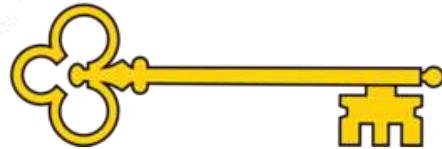


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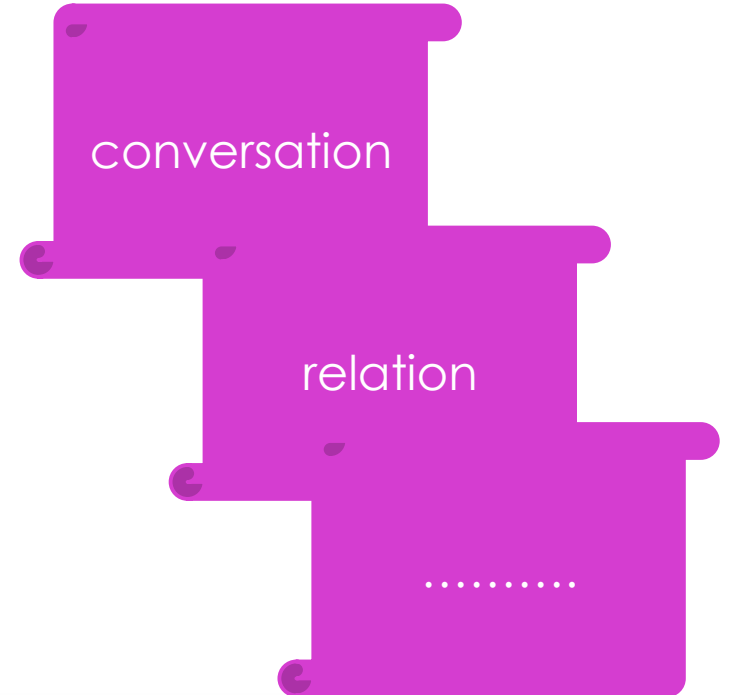
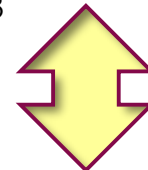
Why?



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Several important thing need to be resolved

Motivation / wish / expectations

Company's need

- ▶ Better position?
- ▶ Better salary?
- ▶ Securing s permanent job?
- ▶ Need on person with PhD....

Personal desire

- ▶ Personal status?
- ▶ Better position?
- ▶ Better salary?
- ▶ Job security?



Conversation with
employer



Motivation / wish / desire?

Personal desire

- ▶ Personal status?
- ▶ Better position?
- ▶ Better salary?
- ▶ Job security?



Does employer agree?

If the answer is no?!

- ▶ Is there still enough motivation / wish / desire?



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Reality...traps...tricky situations

IT'S ALL ABOUT THE
MONEY.

<https://images.app.goo.gl/pY35wKTqzMHcHVE8>

...or it is not?!

It is very important to:

- ▶ distinguish study costs (scholarship) and costs of PhD work
- ▶ know who will cover the costs (company, PhD student, mentor in the frame of some project...)



Can PhD student working in industry be envoled in mentor's project?

→ Legal issue, time....

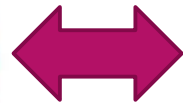
When and how to do a PhD?

Time

- ▶ When to do the experiments?
 - ▶ During vacations
 - ▶ During the afternoons?



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Relations with working colleagues (industry / mentor's lab)

- ▶ Good cooperation with colleagues in mentor's lab
 - ▶ partially share some operations (preparations, reading the results...)
- ▶ Relations with colleagues in working team
 - ▶ agreement
 - ▶ working hours

PhD topic

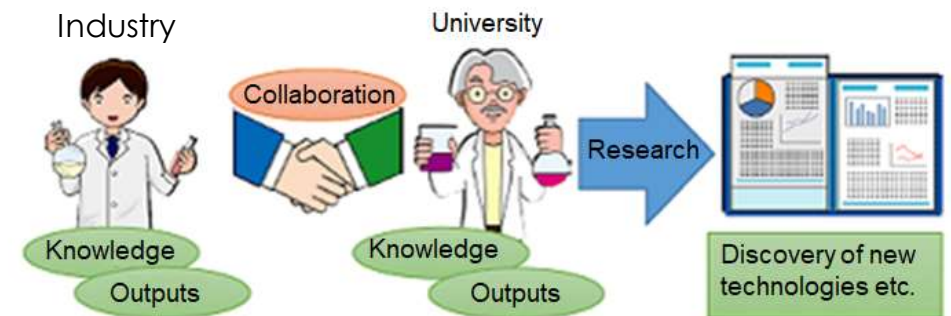
- ▶ student's primary work?
 - ▶ development / research sector?
 - ▶ connection with PhD topic?
 - ▶ experiment(s) in the working place?

Yes

Ideal situation



collaboration



Adapted according to
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PhD topic

- ▶ student's primary work?
 - ▶ development / research sector?
 - ▶ connection with PhD topic?
 - ▶ experiment(s) in the working place?

No

routine work,
no direct connection
with PhD topic
.....

strong motivation
good preparation
communication
collaboration



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Is this a insurmountable
problem?

Other obstacles or opportunities

- ▶ exams (extra time)
 - ▶ connect with PhD study colleagues working at the university (good source of information)

- ▶ dissemination (extra time, traveling..)



- ▶ family obligations (how to align everything?)



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Final product

- ▶ ownership
- ▶ patent application
 - ▶ secret PhD defense?



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Mentoring – Relationship - Communication

- ▶ Both the mentor and the student are responsible for the final outcome
- ▶ Mentor-student relationship is key for successful PhD
 - ▶ Collaborative, learning relationship
 - ▶ Collaboration vs. More autonomous work
 - ▶ Communication
 - ▶ Live / online
 - ▶ Transfer of good scientific practice
 - ▶ Conflict resolution
 - ▶ Compromise between the mentor's expertise and the student's own ideas
 - ▶ Scientific vs. Practical approach
 - ▶ Honest and confidential relationship
 - ▶ Give support
 - ▶ Respect
 - ▶ Monitoring progress
 - ▶ The log



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l/jWcocdN297MMZtZu8](https://images.app.goo.gl/jWcocdN297MMZtZu8)

At the end...

- ▶ MSc Lenkica Penava (Belupo d.d.): Development of nutraceutical products with probiotics (mentor: assis. prof. Andreja Leboš Pavunc, in progress)
- ▶ mag. ing. biotechn. Nina Čuljak (HRZZ project, FFTB): Potential therapeutic biomolecules of next-generation probiotics (mentor: assis. prof. Andreja Leboš Pavunc, in progress)
- ▶ mag. ing. biotechn. Martina Banić (FFTB): Potential therapeutic biomolecules of probiotic strains of autochthonous lactic acid bacteria (mentor: prof. Blaženka Kos, in progress)
- ▶ mag. ing. biotechn. Katarina Butorac (FFTB): Functional role of exopolysaccharides and bacteriocins in the probiotic activity of autochthonous lactic acid bacteria strains (mentor: prof. Jasna Novak, in progress)
- ▶ mag. ing. biol. Petra Džidara (CKN): Identification and functionality of bacterial strains in probiotic preparations on Croatian market (mentor: prof. Jasna Novak, in progress)

Your experiences?

- ▶ Positive?
- ▶ Negative?
- ▶ students employed in the industrial sector?

“TELL ME AND I FORGET,
TEACH ME AND I MAY REMEMBER,
INVOLVE ME AND I LEARN.”

~ BENJAMIN FRANKLIN

EmilysQuotes.Com

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**THANK YOU
FOR YOUR
ATTENTION**



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