Prospective supervisor's form

Name of the supervisor: Paweł Sachadyn

Academic title: dr hab.inż., GUT professor

Orcid ID number: https://orcid.org/0000- https://orcid.org/0000-0002-5087-844X

Faculty of Chemistry

Gdańsk University of Technology **Department of** Molecular Biotechnology and Microbiology, Laboratory for Rege

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Discipline[i] chemical sciences [NCh] none

Optional

Key words (obligatory four key words describing research interests / expertise):

regenerative biotechnology

regenerative medicine

molecular biotechnology

epigenetics

Bibliometric indicators

1. Number of journal publications in WoS/ Scopus 37/39
2. Citations excluding self-citations WoS 270 Scopus 243
3. Hirsch index WoS 11 Scopus 11

1. The number of PhD students who have graduated under your supervision: 3
2. The number of PhD students currently supervised:
   a. within the current doctoral school 1
   b. within doctoral studies (previous system 2
3. Are you currently accepting new PhD students:
   a. Polish *Yes/No* Yes
   b. Foreign *Yes/No* No

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Research interests or topics offered for PhD research (no more than 2000 characters)[ii]

The Laboratory for Regenerative Biotechnology (LRB), I am the head of, is focused on molecular basis of mammalian regeneration, in particular the epigenetic aspects of regenerative potential and pharmacological stimulation of regeneration.
In our studies, we use mouse models, and examine transcriptomic and methylomic profiles in regenerating tissues.
The latest achievement of LRB is the development and application of a novel pharmacological strategy for regenerative therapy on an animal model. This therapy is based on the combined use of an epigenetic inhibitor and a transcriptional activator leading to epigenetic de-repression of silenced genes and transcriptional inductions.

EPIGENETIC BASIS OF REGENERATION
Epigenetic regulation determines developmental and cell differentiation processes as well as stem cell potential. Regenerative abilities decline with development. We conjecture that transient epigenetic re-patterning could result in the temporary restoration of regenerative capacity characteristic of embryonic and neonatal periods but repressed in adults, thus promoting tissue regeneration.
Our studies conducted in three mammalian models of regenerations: the adult MRL/MpJ mouse, the neonatal murine heart and the mouse foetal skins showed decreased methylation of developmental genes that are usually silenced in adult organisms.

PHARMACOLOGICAL STIMULATION OF REGENERATION
While regenerative medicine concentrates on stem cells and cell-based therapies, our studies are directed towards pharmacological activation of endogenous regenerative potential in vivo.
Our studies showed that complex tissue regeneration could be effectively stimulated pharmacologically in adult mammals. Patent applications have been filed to protect novel drug candidates for regenerative therapies.

Funding or special equipment needed to carry out a PhD project[iii]:

1. Is funding available for experimental work: *Yes/No/not needed* — Yes
2. Is the equipment needed to complete a PhD project available in your lab/department: *Yes/No/not needed* — Yes

Most important publications – no more than 5 published after 1.01.2018

No	Authors/title/journal	Number of points according to the current list of the Ministry of Science and Higher Education	Publication year
1.	Sass P, Sosnowski P, Podolak-Popinigis J, Górnikiewicz B, Kamińska J, Deptuła M, Nowicka E, Wardowska A, Ruczyński J, Rekowski P, Rogujski P, Filipowicz N, Mieczkowska A, Peszyńska-Sularz G, Janus Ł, Skowron P, Czupryn A, Mucha P, Piotrowski A, Rodziewicz-Motowidło S, Pikuła M, Sachadyn P*. Epigenetic inhibitor zebularine activates ear pinna wound closure in the mouse	140	2019
2.	Skowron PM, Krawczun N, Zebrowska J, Krefft D, Zołnierkiewicz O, Bielawa M, Jezewska-Frackowiak J, Janus L, Witkowska M, Palczewska M, Schumacher A, Wardowska A, Deptula M, Czupryn A, Mucha P, Piotrowski A, Sachadyn P, Rodziewicz-Motowidlo S, Pikula M, Zylicz-Stachula A. A vector-enzymatic DNA fragment	140	2020

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3.	Deptuła M, Karpowicz P, Wardowska A, Sass P, Sosnowski P, ... , Czupryn A, Janus Ł, Mucha P, Skowron P, Piotrowski A, Sachadyn P, Rodziewicz-Motowidło S, Pikuła M. Development of a peptide derived from Platelet-Derived Growth Factor (PDGF-BB) into a potential drug candidate for the treatment of wounds. Advances in Wound Care.	140	2019
4.	Mieczkowska A, Schumacher A, Filipowicz N, Wardowska A, Zieliński, ... , Czupryn A, Mucha P, Sachadyn P, Janus Ł, Skowron P,Rodziewicz-Motowidło S, Cichorek M, Pikuła M, Piotrowski A. Immunophenotyping and transcriptional profiling of in vitro cultured human adipose tissue derived stem cells. Sci Rep. 2018 Jul 27;8(1):	140	2018
5.	Kamińska J, Langa P, Deptuła M, Zieliński J, Sachadyn P*, Wardowska A, Pikuła M. Transcriptional activity of epigenetic remodeling genes declines in keratinocytes after in vitro expansion. Adv Med Sci. 2019 Sep;64(2):274-279.	100	2019

Most recent externally funded projects you were involved in – no more than 3

No	Project title, the name of the Principal Investigator (PI) and the institution the project was carried out	Years	Role in the project [iv]
1.	BIONANOVA „New generation bioactive molecules delivery systems, based on chemically synthesised and obtained through genetic engineering nanobiomaterials" TECHMATSTRATEG2/410747/11/2019, amount 24 623 487 PLN (including the GUT work package 2 949 375 PLN); conducted at GUT, funded by the National Centre for Research and Development of Poland; PI	2019-2022	PI
2.	REGENNOVA "Novel technologies for pharmacological stimulation of regeneration"; amount: 17,769,556 PLN (including the GUT work packages 2,002,501 PLN); conducted at GUT, funded by the National Centre for Research and Development of Poland; PI Paweł Sachadyn	2014-2018	PI
3.	"The epigenetic basis of regeneration in mammals: Genome-wide DNA methylation profiling in the MRL mouse"; 2011/01/B/NZ2/05352; amount 455,000 PLN; conducted at GUT; funded by the National Science Centre of Poland; PI Paweł Sachadyn	2010-2014	PI

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Additional relevant information (no more than 1600 characters)[v]

Candidates are encouraged to contact me anytime by email: psach@pg.gda.pl.

[i] You may select up to two disciplines out of 12 disciplines represented in the Doctoral School

[ii] Observe the limit of not more than 2000 characters

[iii] Leave only one answer

[iv] Select the role in the project: PI stands for principal investigator (refers to the holder of an independent grant and the lead researcher for the grant project), Co-I for co-investigator (Co-I assists the principal investigator in the management and leadership of the research project), R for researcher

[v] Add any other relevant information e.g. awards for PhD students whom you supervised (no more than 1600 characters)