The result of the mid-term assessment together with the justification
Wynik oceny śródokresowej wraz z uzasadnieniem

for the period 01.10.2020 to 31.08.2022

Michał Żurkowski

the doctoral student at PUT Doctoral School / doktorant Szkoły Doktorskiej PP

discipline of science / dyscyplina naukowa: **informatyka techniczna i telekomunikacja / information and communication technology**

The result of assessment / Wynik oceny

Positive / Pozytywna*	Negative / Negatywna*

Justification / Uzasadnienie

Michał Żurkowski in his PhD research focuses on 3D modeling of nucleic acid structures. In particular, the goal is to develop new models and methods for computational modeling and analysis of 3D structures that contain quadruplex motifs. These models and methods are relevant from both research and practical perspectives – they should contribute to scientific studies on the structure-function relation in nucleic acids and facilitate the development of new diagnostic tools and therapies oriented on DNA and RNA, and the generation of synthetic molecules of nucleic acids.

Expected results include: (1) a repository of quadruple structure models (determined experimentally) integrated with the RNAComposer system, (2) a suite of web-accessible bioinformatic tools for presenting these models, (3) new methods for modeling and evaluating nucleic acid structures with quadruplexes involving artificial intelligence (AI) techniques, e.g., machine learning methods or genetic algorithms, and (4) journal papers and conference presentations describing the proposed methods, tools and repositories.

Many important research goals from the list above have been already achieved. In particular, the doctoral candidate together with the rest of the research team completed the following tasks:
- developed and deployed the ONQUADRO database with quadruple structures,
- proposed visualization methods for quadruple structures and implemented them in form of the DrawTetrado system
- proposed methods of matching and evaluating similarities of quadruplex structures and implemented them in form of the RNAhugs system.

The ONQUADRO database and the DrawTetrado system have been described in two papers published in Nucleic Acid Research, and Bioinformatics, respectively (each journal is awarded with 200 ministerial points). Moreover, the third journal paper describing RNAhugs is being finalized and it will be soon submitted for publication. Finally, the research results were presented at three international workshops and conferences, ECCO XXXV – CO 2022 and at a seminar hosted at PUT.

It should be also noted that Michał Żurkowski received an SBAD_MK grant titled "Effective algorithms for RNA 3D structure comparison (3DRNALI)", where he is the Principal Investigator.

Given the results obtained in the first two years of doctoral studies and the progress in realization of the IRP (45% vs. 40% initially assumed in the IRP) the final assessment is **very positive**.

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On behalf of the Commission / Za Komisję

27.09.2022
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Date

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Legible signature of Head of Commission

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