

**External Reviewer:**

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**PhD Candidate:**

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Author: Carolina Sofia Pereira Roxo

Title: *"Investigations on structural and physicochemical features potentially correlated with G-quadruplexes antiproliferative activity"*

University: Institute of Bioorganic Chemistry, Polish Academy of Sciences

Supervisor: Associate Professor Anna Pasternak

Co-supervisor: Dr. Weronika Kotkowiak

**Evaluation:**

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Please, include x or a mark between 0-10 regarding the following aspects:

	Deficient	Fair	Medium	Very Good	Excellent
Structure and composition	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Originality	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Objective	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Contribution	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
State of the art	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Methodology	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Relevance of Results	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Quality of work	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Conclusions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
References	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Layout	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>



After the revision of this Doctoral Thesis, the general evaluation is:

Fail / Rejected     Pass / Medium     Good     Very good / Excellent

to be presented at the Institute of Bioorganic Chemistry PAS.

#### **REASONED EVALUATION, COMMENTS, OR OTHER OBSERVATIONS**

The main objective of this thesis lies in the investigation of the structural and physicochemical features of diverse G-quadruplex structures and their biological potential as anticancer agents. The specific objectives coincide with four publications during the PhD work plan: 1 review (chapter 1) and 3 research articles (remaining chapters), which are very well structured with a complete biophysical characterization of DNA G-quadruplex sequences, UNA, LNA, and 2'-O-Me-RNA modifications in the DNA sequences and implications in G-quadruplex thermodynamic stability, structure, biological activity, and enzymatic resistance; and finally investigation of RNA G-rich sequences and their DNA counterparts in terms of structure-function relationship and potential therapeutic agents with anticancer properties.

The candidate is the first author of the 3 publications and co-author of the remaining paper. She also published one more article as a co-author during the first wave of the COVID-19 pandemic. In addition, she participated in several funded projects, conferences as a presenter and received several awards.

The state-of-the-art, objectives and methodologies are clear and comprehensible.

An adequate survey of the state-of-the-art is presented, namely regarding the G-quadruplex structures as targets and therapeutics.

Nevertheless, a quick and final typographical check of the whole document is still advised to correct any remaining typos or grammar errors.

Overall, I am very pleased with the very good quality of this thesis, and the scientific depth and rigor is high, including the results and discussion.

Hence, it is my strong conviction that the" dissertation being the subject of the review fulfills the conditions laid down in the Act of July 20, 2018, The Law on Higher Education and Science (Journal of Laws 2018, item 1668 as amended), the Act of July 3, 2018, Provisions Introducing the Act – The Law on Higher Education and Science (Journal of Laws 2018, item 1669 as amended), and The Rules of Proceeding in the Matter of Awarding the Doctoral Degree in the Institute of Bioorganic Chemistry PAS (Resolution of the Scientific Board of IBCH PAS No. 59/2023/Internet of March 29, 2023) and **I recommend that the Scientific Board of the Institute of Bioorganic Chemistry PAS allows it to further steps in PhD defense process"**.

Signed:

Date: 22/7/2023