proceedings

MDPI

Abstract

PCSK9 and Thyroid Tumor Dynamics: Exploring the Metabolic–Oncogenic Interface in PTC Patients †

Micaela A. Soares [1], Dante M. T. Teixeira [1], Bruna R. Gontijo [1], Calliandra M. S. Silva [2], Rafael M. Morais [3], Ligia C. A. Cardoso-Duarte [2], Jamila R. Oliveira [2], Cristina L. B. Furia [1] and Izabel C. R. da Silva [1,2,*]

[1] Faculty of Health Sciences and Technology, University of Brasília (UnB), Ceilândia Campus, Brasília 72220-275, Brazil; micaelaalmeida02@gmail.com (M.A.S.); mafra.dante11@gmail.com (D.M.T.T.); brunargontijo.unb@gmail.com (B.R.G.); furiacristina@gmail.com (C.L.B.F.)
[2] Postgraduate Program in Health Sciences, University of Brasília (UnB), Ceilândia Campus, Brasília 72220-275, Brazil; cdssilva@gmail.com (C.M.S.S.); ligia.canongia@gmail.com (L.C.A.C.-D.); jamila@unb.br (J.R.O.)
[3] Pharmacy Sector, Syrian-Lebanese Hospital, Asa Sul, Brasília 70200-730, Brazil; rafaelmartins.unb@gmail.com
* Correspondence: belbiomedica@gmail.com
† Presented at the 6th International Congress on Health Innovation—INOVATEC 2025, Hybrid, 21–23 November 2025.

Keywords: PCSK9; thyroid neoplasms; genetic polymorphism

Introduction: PCSK9 encodes a protein that regulates cholesterol homeostasis by promoting degradation of the low-density lipoprotein receptor (LDLR), thereby increasing plasma LDL-cholesterol levels and influencing cardiovascular risk. Emerging evidence suggests that LDLR also contributes to tumor progression, particularly in papillary thyroid carcinoma (PTC), where its overexpression enhances LDL uptake and activates the RAS/RAF/MEK/ERK pathway—especially in tumors harboring the aggressive BRAF V600E mutation. This study investigated the association between the PCSK9 E670G variant and clinical parameters in PTC, exploring its potential as a biomarker at the intersection of lipid metabolism and oncogenesis. **Methodology**: This pilot study included 11 PTC patients from the Federal District (UniCEUB Ethics Committee-CAAE No. 57382416.6.0000.0023). The PCSK9 E670G variant was genotyped from patients' extracted peripheral blood DNA using the PCR-RFL method. Statistical analysis employed Pearson's chi-square and Mann–Whitney U tests ($p < 0.05$). **Results**: Nine patients with the AA genotype (81.8%) were identified in the group, and 18.2% had the AG genotype. Among PTC patients, the AA genotype was more frequent in those receiving intermediate radioiodine doses and in early tumor stages (T1+T2). AA carriers were evenly distributed between N0 and N1 lymph node status, while AG carriers were predominantly N1. Women were more prevalent in the RR group. **Conclusions**: Although no statistically significant associations were identified, genotype-related patterns suggest potential clinical relevance of PCSK9 in thyroid cancer, warranting further investigation in larger cohorts.

Author Contributions: Conceptualization, M.A.S. and I.C.R.d.S.; methodology, M.A.S., D.M.T.T., B.R.G., C.M.S.S., R.M.M., L.C.A.C.-D., J.R.O., I.C.R.d.S. and C.L.B.F.; validation, M.A.S., D.M.T.T., B.R.G., C.M.S.S., R.M.M., L.C.A.C.-D., J.R.O., I.C.R.d.S. and C.L.B.F.; formal analysis, M.A.S.; investigation, M.A.S., D.M.T.T., B.R.G., C.M.S.S., R.M.M., L.C.A.C.-D., J.R.O., I.C.R.d.S. and C.L.B.F.; data curation, M.A.S.; writing—original draft preparation, M.A.S.; writing—review and editing, all authors; visualization, M.A.S.; supervision, I.C.R.d.S.; project administration, I.C.R.d.S.; funding acquisition, I.C.R.d.S. All authors have read and agreed to the published version of the manuscript.

Check for updates

Academic Editors: Andreanne Vasconcelos, Amílcar Damazo and José Roberto Leite

Published: 2 March 2026

Copyright: © 2026 by the authors. Licensee MDPI, Basel, Switzerland. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license.

Funding: This research was funded by CAPES process n° 00193-00002187/2023-24, the National Council for Scientific and Technological Development (CNPq) with the Ministry of Health/Department of Science and Technology (MS/Decit) process n° 444755/2023-3 and DPI-DPG-UnB Edital 001.

Institutional Review Board Statement: The study was conducted in accordance with the Declaration of Helsinki, and approved by the Research Ethics Committee of the Health Department of the Federal District (FEPECS/SES-DF) (protocol code CAAE 57382416.6.0000.0023, approved on 15 March 2017.

Informed Consent Statement: Informed consent was obtained from all subjects involved in the study. All participants signed the Free and Informed Consent Form (TCLE) prior to blood sample collection, as approved by the Research Ethics Committee of the Health Department of the Federal District (FEPECS/SES-DF), protocol CAAE 57382416.6.0000.0023.

Data Availability Statement: The datasets generated and analyzed during the current study are not publicly available due to privacy restrictions but are available from the corresponding author on reasonable request.

Conflicts of Interest: The authors declare no conflicts of interest.

Disclaimer/Publisher's Note: The statements, opinions and data contained in all publications are solely those of the individual author(s) and contributor(s) and not of MDPI and/or the editor(s). MDPI and/or the editor(s) disclaim responsibility for any injury to people or property resulting from any ideas, methods, instructions or products referred to in the content.