Gene Expression **2026** vol. 25(3) | e00081
DOI: 10.14218/GE.2025.00081

Editorial

Perspectives on Cancer Immunotherapy Discussed at a 2025 Symposium in Cuba

Yuriy L. Orlov[1*], Monica R. Bequet[2], Peter V. Shegai[3], Dania M. Vazquez[2], Anton V. Snegovoy[3], Julio R. Fernández[2], Inna A. Apolikhina[1,3], Daria V. Bagdasarova[3], Alexander N. Kuznetsov[3], Oleg I. Apolikhin[4], Marta Ayala Avila[2] and Andrey D. Kaprin[3]

[1]Sechenov First Moscow State Medical University of the Russian Ministry of Health (Sechenov University), Moscow, Russia; [2]Center for Genetic Engineering and Biotechnology, Havana, Cuba; [3]National Medical Research Radiological Centre of the Ministry of Health of the Russian Federation, Moscow, Russia; [4]N. Lopatkin Scientific Research Institute of Urology & Interventional Radiology - branch of the federal state budgetary institution "National Medical Research Centre of Radiology" of the Russian Ministry of Health, Moscow, Russia

Received: October 25, 2025 | **Revised:** May 15, 2026 | **Accepted:** July 19, 2026 | **Published online:** July 29, 2026

Dear Editor,

We highlight current trends in cancer studies based on discussions at a symposium held in Cuba in 2025 that focused on clinical trials of new cancer drugs. The "Innovate, Collaborate, Conquer: The Future of Oncology" symposium covered a wide array of cancer topics, including personalized immunotherapy (https://www.xiahepublishing.com/news/internationalsymposium-cancer2025). The symposium included an overview of RNA therapeutics by Dr. Ranjan Perera from Johns Hopkins University School of Medicine. Vascular endothelial growth factor-targeted immunotherapy was a prominent theme, with Dr. Yanelys Morera Díaz and Dr. Mónica Bequet Romero from the Center for Genetic Engineering and Biotechnology (CIGB) presenting phase II results on HEBERSaVax immunotherapy.[1] Further discussions on enhancing T-cell responses included a talk by Isaac Quirós at the University of Costa Rica, who presented a novel strategy to potentiate tumor-reactive T-cell receptor signaling strength using costimulatory chimeric antigen receptors.

Diverse cancer-targeting and immunomodulatory strategies are being developed, including peptide-based therapeutics, therapeutic cancer vaccines, and hormone-based immunotherapies.[1-3] Dr. Tania Crombet from the Center of Molecular Immunology presented nimotuzumab, an anti-epidermal growth factor receptor antibody. Nimotuzumab has been reported to inhibit cell proliferation and angiogenesis and may activate natural killer cells, stimulate dendritic cell maturation, and induce cytotoxic T-cell responses.[4] Dr. Julio Fernández from CIGB presented CIGB-552, an investigational multimodal peptide, in the context of colorectal cancer. The inactivation of signaling induced by membrane oncogenes provides a rationale for vaccines that generate a polyclonal antibody response. Preclinical evidence suggests that epidermal growth factor receptor family oncogenes could be targeted by antibodies generated through vaccination to potentially block receptor-mediated signaling and contribute to an antitumor effect in cancer cells.[5,6]

Hormone-based therapy is another field of cancer research discussed at the symposium. One example is Heberprovac, a gonadotropin-releasing hormone (GnRH)-based vaccine candidate containing the GnRHm1-TT peptide as the main active component.[2] Protein-protein interactions form an intricate cellular network known as the interactome, which is essential for cellular processes such as gene regulation, signal transduction, and metabolic pathways. The dysregulation of this network in cancer provides a rationale for peptide-based inhibitors targeting such interactions.[7]

Oncolytic virotherapy was an important discussion point presented by Dr. Daria Bagdasarova from P. Hertsen Moscow Oncology Research Institute, who reviewed preclinical findings on oncolytic enteroviruses lysing primary triple-negative breast cancer cells *ex vivo*.

The role of biosimilars in oncology was discussed. Dr. Daniel Martínez Ávila from the Institute of Oncology and Radiobiology presented BCD-201, a pembrolizumab biosimilar investigated for refractory Hodgkin lymphoma. Dr. Iraldo Bello Rivero from CIGB presented HeberFERON in the context of advanced renal cell carcinoma. A series of antitumor peptides with the CIGB designation was designed and tested by the Center for Genetic Engineering and Biotechnology in Cuba. The cell-penetrating peptide-based inhibitor CIGB-300 has been reported to impair the viability and proliferation of lung adenocarcinoma and lung squamous carcinoma cells in a dose-response manner.[8] Casein kinase 2 (CK2) is a constitutively active and frequently overexpressed enzyme that fosters tumor survival, proliferation, and metastasis. CK2 inhibition by CIGB-300 was reported to induce early reactive oxygen species production and mitochondrial membrane depolarization in lung cancer cells.[8] CIGB-300 antic-

***Correspondence to:** Yuriy L. Orlov, Center of Digital Health and AI in Medicine, Sechenov First Moscow State Medical University of the Ministry of Health of the Russian Federation, Trubetskaya 8-2, Moscow 119048, Russia. ORCID: https://orcid.org/0000-0003-0587-1609. Tel: +7-495-609-14-00, Fax: +7-499-248-01-81, E-mail: orlov@bionet.nsc.ru
How to cite this article: Orlov YL, Bequet MR, Shegai PV, Vazquez DM, Snegovoy AV, Fernández JR, *et al*. Perspectives on Cancer Immunotherapy Discussed at a 2025 Symposium in Cuba. *Gene Expr* 2026;25(3):00081. DOI: https://doi.org/10.14218/GE.2025.00081.

ancer activities have been investigated in preclinical models of lung cancer and in acute myeloid leukemia cells.[3,8]

Radioimmunotherapy was another field of cancer treatment discussed at the symposium. Conjugation of antitumor peptides with radionuclides could integrate the approaches and methods developed in Cuba and Russia (https://forum-forlife.ru/). Joint Cuban-Chinese research on cancer treatment peptides was also noted.[8] More broadly, vaccine-design approaches may also have applications beyond oncology.[9]

To recap, the symposium provided an outlook on the evolving landscape of cancer treatment strategies, ranging from RNA therapeutics targeting specific noncoding RNAs and transcriptional activators to personalized messenger RNA vaccine design leveraging advanced bioinformatics for neoantigen identification, as well as the investigation of "undruggable" targets. Measures to improve the efficiency of antitumor medicinal therapy, surgery, and radiotherapy for cancer patients, including approaches evaluated in preclinical studies, were discussed and will continue to be addressed in complementary conference series (https://forum-forlife.ru/). These approaches span different stages of development, and the symposium discussions should not be interpreted as evidence of comparative clinical efficacy.

Acknowledgments

The authors are grateful to the meeting organizers for their support and fruitful discussions.

Funding

YLO was supported by RSF 24-24-00563.

Conflict of interest

YLO has served as an editorial board member of *Gene Expression* since August 2023. The authors declare no other conflicts of interest.

Author contributions

Conceptualization (YLO, MRB, JRF); methodology (MRB); investigation (PVS, DMV, AVS, JRF, IAA, DVB, ANK, OIA); writing – original draft (YLO, MRB, JRF); writing – review and editing (IAA, MRB, YLO); supervision (OIA, MAA, ADK). All authors have approved the final version and publication of the manuscript.

References

[1] Hernández-Bernal F, Bernal KS, Bequet-Romero M, Martín-Bauta Y, Catasús-Álvarez KM, Carreño-Rolando IE, *et al*. HEBERSaVax immunotherapy combined with first-line chemotherapy in advanced ovarian cancer: Phase II CENTAURO-4 trial results. Int J Cancer 2026; 158(6):1628–1639. DOI: 10.1002/ijc.70199, PMID: 41099583.

[2] Campal-Espinosa AC, Junco-Barranco JA, Fuentes-Aguilar F, Calzada-Aguilera L, Rivacoba-Betancourt A, Rodríguez-Bueno RH, *et al*. Influence of Humoral Response Against GnRH, Generated by Immunization with a Therapeutic Vaccine Candidate on the Evolution of Patients with Castration-Sensitive Prostate Adenocarcinoma. Technol Cancer Res Treat 2023;22:15330338231207318. DOI: 10.1177/15330338231207318, PMID: 37828833.

[3] Vázquez-Blomquist D, Ramón AC, Rosales M, Pérez GV, Rosales A, Palenzuela D, *et al*. Gene expression profiling unveils the temporal dynamics of CIGB-300-regulated transcriptome in AML cell lines. BMC Genomics 2023;24(1):373. DOI: 10.1186/s12864-023-09472-5, PMID: 37400761.

[4] Crombet Ramos T, Mestre Fernández B, Mazorra Herrera Z, Iznaga Escobar NE. Nimotuzumab for Patients With Inoperable Cancer of the Head and Neck. Front Oncol 2020;10:817. DOI: 10.3389/fonc.2020.00817, PMID: 32537431.

[5] Bermudez-Abreut E, Bergado-Báez G, Fundora-Barrios T, Arencibia-Perezleo J, Lopez Medinilla A, Chao L, *et al*. HER1 (EGFR) and/or HER2 Inclusion Potentiates the Antitumor Effect Elicited by a HER3-Specific Monovalent Vaccine. Mol Cancer Ther 2025;24(8):1226–1239. DOI: 10.1158/1535-7163.MCT-24-0973, PMID: 40237095.

[6] Ramírez BS, Alpízar YA, Fernández DR, Hidalgo GG, Capote AR, Rodríguez RP, *et al*. Anti-EGFR activation, anti-proliferative and pro-apoptotic effects of polyclonal antibodies induced by EGFR-based cancer vaccine. Vaccine 2008;26(38):4918–4926. DOI: 10.1016/j.vaccine.2008.07.018, PMID: 18672015.

[7] Afonso AL, Cavaleiro CT, Castanho MARB, Neves V, Cavaco M. The Potential of Peptide-Based Inhibitors in Disrupting Protein-Protein Interactions for Targeted Cancer Therapy. Int J Mol Sci 2025;26(7):3117. DOI: 10.3390/ijms26073117, PMID: 40243822.

[8] Yi Y, Dai L, Lan Y, Tan C, Vázquez-Blomquist DM, Zeng G, *et al*. CIGB-300 internalizes and impairs viability of NSCLC cells lacking actionable targets by inhibiting casein kinase-2 signaling. Sci Rep 2024;14(1):26038. DOI: 10.1038/s41598-024-75990-1, PMID: 39472715.

[9] Lobaina Y, Chen R, Suzarte E, Ai P, Musacchio A, Lan Y, *et al*. A Nasal Vaccine Candidate, Containing Three Antigenic Regions from SARS-CoV-2, to Induce a Broader Response. Vaccines (Basel) 2024;12(6):588. DOI: 10.3390/vaccines12060588, PMID: 38932317.