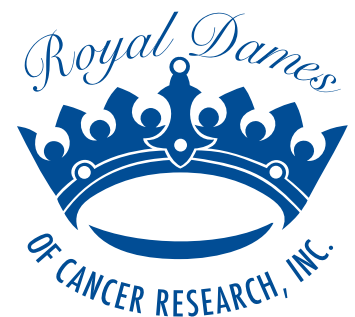
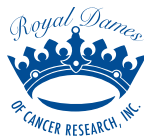




RESEARCH UPDATE



NSU Rumbaugh-Goodwin Institute
for Cancer Research



NSU RUMBAUGH-GOODWIN INSTITUTE FOR CANCER RESEARCH

MISSION

Through innovative research, we are developing sensitive methods for detection, devising novel strategies for prevention, discovering new drugs for curing cancer, and saving human lives.

IN THIS REPORT

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Addressing Brain Cancer

Pediatric Neuroblastoma Project

Ovarian Cancer Research

Melanoma Project

Recent Grant Submissions

“ *Mankind is
not destined
to die from
cancer.* ”

EXECUTIVE SUMMARY

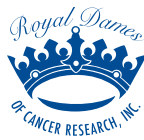
“Our exceptionally trained research scientists and students come to the lab every day, collectively focused on developing novel cancer therapies that will reach patients’ bedsides in the near future.”

—Appu Rathinavelu, Ph.D.

Director, NSU Rumbaugh-Goodwin Institute for Cancer Research

For more than 60 years, NSU’s Rumbaugh-Goodwin Institute for Cancer Research (RGI) has been conducting groundbreaking studies to advance the understanding and treatment of the most aggressive forms of cancer—one of humanity’s most formidable foes. With the generous and dedicated support of the Royal Dames of Cancer Research, which totals \$5,685,350 as of September 2025, RGI has focused on research to improve cancer diagnosis, treatment, and prognosis. Its breadth of research and discovery includes drug developments for brain, breast, lung, ovarian, pediatric, and prostate cancers, among others.

This issue of the *RGI Research Update* highlights the various research activities and achievements occurring between March and September 2025, including the institute’s most promising drug discovery for treating brain cancer, F16, which has been renamed RD1 in tribute to the Royal Dames’ long-standing support.



GLIOBLASTOMA PROJECT

In 2007, Appu Rathinavelu, Ph.D., RGI director, identified drug targets and small molecule compounds (drugs code named RD1 and JFD) that inhibit cancer growth with low toxicity. The next several years were dedicated, in part, to conducting extensive preclinical testing and developing formulations for RD1 and JFD.

In 2015, Rathinavelu made a breakthrough discovery: Intraperitoneally injected RD1 passed through the blood-brain barrier. NSU responded quickly by developing a team of Ph.D.-level technology managers and patent attorneys to design definitive and enabling experiments. Rathinavelu and his research team at RGI spent three weeks at the Mayo Clinic to study their animal models for brain cancer (glioblastoma) research. Upon returning, the RGI team reproduced the Mayo Clinic animal model at the NSU Center for Collaborative Research (CCR) and began experiments. The results from the RGI's RD1 experiments were promising and used to file for worldwide patent protection and publish high-impact papers.

In 2022, RGI began its planning for first in-human phase I clinical trials.

In 2024, NSU initiated discussions with University of Iowa Pharmaceuticals (UI Pharmaceuticals), a clinical research development organization (CRDO), and Charles River Laboratories of Boston, Massachusetts, a contract research organization (CRO), to reformulate and externally validate the clinical use of RD1 for treating glioblastoma.

In July 2025, NSU signed an agreement with University of Iowa Pharmaceuticals (UI Pharmaceuticals) for creating a clinical formulation of RD1 to be used on humans.

In August 2025, UI Pharmaceuticals initiated preformulated work with RD1.

RGI's patented F16 drug has been renamed as RD1 (Royal Dames 1) in tribute to the philanthropic organization whose investment made this drug discovery possible.

PRODUCT DEVELOPMENT PLAN

STEP 1

Collaborate with UI Pharmaceuticals (CRDO) and complete the clinical formulation of RD1. *Ongoing*

STEP 2

Complete the evaluation of the brain delivery and safety of the clinical formulation of RD1. *Scheduled for completion in December of 2026*

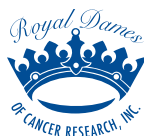
STEP 3

CRDO charts a clear course for navigating investigational new drug (IND) filing and administration.

EXECUTE DEVELOPMENT PLAN

- Refine formulation of RD1 as an intravenous (IV) injectable with therapeutic solubility. (CRDO + RGI)
- Conduct confirmation preclinical testing to freeze the formulation. (CRDO + RGI)
- Develop pre-IND documents and meet with the Food and Drug Administration (FDA) for a pre-IND meeting. (CRDO or + RGI)
- Manufacture RD1 under good manufacturing practices (GMP). (CRDO)
- Conduct definitive preclinical studies under good laboratory practices (GLP) conditions. (RGI + CRDO)
- Develop documents and apply for IND for phase I clinical trials. (CRDO)
- Secure granted IND. (FDA)
- Initiate phase I clinical trials. (CRDO)





2024-2026

ADDITIONAL TESTING AND RESEARCH

PEDIATRIC NEUROBLASTOMA

RGI initiated new research in 2023 under the leadership of Appu Rathinavelu, Ph.D., RGI director, to find better cures for treating pediatric neuroblastoma. With start-up funding from the National Pediatric Cancer Foundation, RGI initiated testing of four compounds for the treatment of pediatric neuroblastoma, including RD1, JFD, bortezomib, and a new drug known as CM-272. Of the four compounds tested, CM-272 was found to be the most potent. RGI completed the in vitro evaluations, which provided convincing data to start the preclinical testing of CM-272, which could be named as RD2 after completion of the preclinical use of CM-272. In August 2025, Rathinavelu and his research team submitted the revised version of the invention disclosure to NSU's Office of Technology Transfer and Commercialization. Additionally, RGI submitted a proposal to the National Cancer Institute requesting a \$100,000 grant for pediatric neuroblastoma research.

OVARIAN CANCER RESEARCH

RGI scientists and graduate students are testing the use of CM-272 and RG-7388 for treating chemo-resistant ovarian cancer cells that are acquired from American Type Culture Collection of USA and from the Hebrew University of Jerusalem, Israel.

MELANOMA PROJECT

Senior RGI researcher Dmitriy Minond, Ph.D., professor at the NSU Barry and Judy Silverman College of Pharmacy, and his research team have demonstrated that previously discovered novel compounds are active against melanoma in two xenograft experimental models.

The compounds were also tested for toxicity and were shown to be nontoxic. In addition, Minond's group discovered that when melanoma tumors are treated by these compounds, it results in the penetration of tumors by multiple immune cell types, which suggests a possibility of utilizing these compounds in combination with immunotherapy agents. Overall, these studies have validated Minond's hypothesis that decreasing levels of spliceosomal protein hnRNPH1/H2, the target of these novel compounds, can be used as a novel antimelanoma therapy. These novel compounds are undergoing additional tests.



RECENT GRANT SUBMISSIONS

Dmitriy Minond, Ph.D., recently received the following external grants:

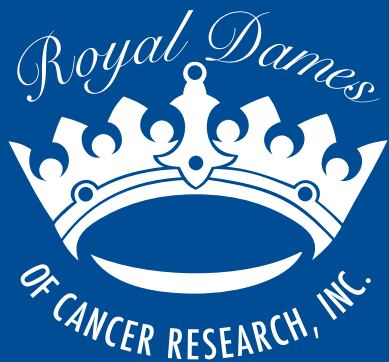
1. R16 grant from NIH/NIGMS RGM159132, “Novel Immunomodulators for Melanoma Therapy,” **\$616,000/3 years**
2. Community Foundation of Broward Cancer Research Grant, “Exosome-Based Immunotherapies for Melanoma,” **\$450,000/3 years**
3. FDOH Casey DeSantis Florida Cancer Innovation Fund Grant, “Pre-clinical studies of spliceosomal immunomodulators in combination with checkpoint inhibitors in humanized melanoma mouse model,” **\$424,289.00/1 year**

Appu Rathinavelu, Ph.D., will be submitting a proposal to the CDMRP (Congressionally Directed Medical Research Programs) in collaboration with the Miami Cancer Institute for developing methods for the “Simultaneous Analysis of Mutations and Methylations in Circulating cfDNA Combined with Spatial Transcriptomics in Circulating Tumor Cells of the Prostate Cancer Patients.” The proposal will request \$1.67 million over 3 years.

MILESTONES

- 7 patents awarded (#1 in NSU)
- 75+ publications
- 130+ presentations
- 175+ undergrad students trained
- 12 Ph.D. students trained
- powerful collaborations with Moffitt, Miami Cancer Institute, Ferris State University, and others
- \$2 million+ in sponsored research
- \$15.75 million+ in philanthropy





royaldames.org



CONTACT US

RESEARCH INQUIRIES

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NSU RESEARCH AT A GLANCE

- Alternative Therapies for the Treatment of Aging and CNS Neurological Conditions
- Cancer Biology
- Cancer/Anticancer Therapies
- Cervical Cancer and HIV Prevention
- Degenerative and Cognitive Brain Research
- Dental/Oral Cancer
- Developing Targeted Therapies for Sarcomas
- Neuroscience and ALS
- Regenerative Medicine

PHILANTHROPY

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TECHNOLOGY TRANSFER

75 Patent Applications	44 Worldwide Patents	21 High-Potential Technologies
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CLINICAL RESEARCH

29 Active Clinical Trials

\$12.5M in Clinical Research Awards
(value is obligated amount from OSP
Managed trials)

SPONSORED PROGRAMS

249 Active Awards during
FY25 totaling **\$185M**