The Panov Program: Toward Precision Sarcoma Care

Sarcoma Research at Mount Sinai's Christopher Sharp Cancer Centre

Advancing precision sarcoma treatment

Mount Sinai's Christopher Sharp Cancer Centre is embarking on a groundbreaking research program with the goal of creating "precision" or personalized treatment for soft tissue sarcoma (STS) cancer. While tremendous strides have been made in treating and even curing osteosarcoma (bone cancer), certain types of STS still have very poor outcomes. In total, about 30% of STS patients have highly aggressive, spreading cancers for which there is no known cure or effective treatment. Mount Sinai's Christopher Sharp Cancer Centre seeks to change this.

The sarcoma surgical and research team at Mount Sinai, together with partners in business, the community and with other lead sarcoma centres, have set out an ambitious research strategy for the next five years. Our plans seek to harness three cutting-edge technologies that are only now becoming practical to use to answer the simple question*: can we find an effective treatment, and even a cure, for STS?*

Our Three-Point Plan

Our five-year research strategy has three parts to it:

Part 1: Taking samples of non-treatable STS and growing them in live mice, then testing some key cancer drugs against each tumor. At the same time, we will conduct extensive genetics analysis of each tumor, and then understand which types of tumors respond to which chemotherapy drugs. Importantly, we will be conducting this research on live human tumors, giving us a window into understanding how real, in-human tumors respond. This technology, offered by our partner, Champions, has been used successfully on individuals, but this research project will be among the first of its kind in the world to ask this question and see it proven out in a controlled research study. **This is our Panov Program**.

Part 2: Second, thanks to rapid advances in technology, we will take our existing bank of sarcoma tumors and samples from all tumors collected in Part 1, and test these tumors against all known pharmacological agents. Where we see successes, we will seek to understand the genetic profile of the tumors, and test the drug through the platform outlined in Part 1, vastly accelerating the hunt to find effective treatment for STS.

Part 3: We will conduct full genetic profiling of the elusive STS tumors, seeking to identify common mutations, and then test these tumors for response using drugs known to affect those mutations. Our research partners at Sick Kids and Princess Margaret Cancer Centre will join us in this work.

Together, our desired outcome is precision treatment targeted to the cancer of each patient.

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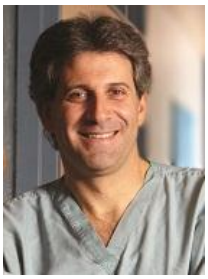
Inspiration from a Patient and his Wife

We are inspired in our work by a tenacious and determined sarcoma patient, Yaron Panov, and his wife, Dr. Rochelle Schwartz-Panov. Mr. Panov had just such a form of unresponsive sarcoma, traditional treatments failed, and then following successful use of the Champions technology was able to identify a chemotherapy agent that worked for him. Cases like those of Mr. Panov inspire Dr. Schwartz and Mount Sinai to pursue this strategy of developing precision treatments on a wider scale. Our research study will show us whether this technique has promise of being used on a timely, precision medicine basis.

Under the leadership of Mount Sinai's Surgeon-in-Chief and renowned Canadian sarcoma researcher Dr. Jay Wunder, Mount Sinai has launched its five-year, $6.6 million, three-point sarcoma research strategy, including the $1.5 million needed for the Panov Project. With commitments of $4.3 million to date, we seek a total of $2.3 million from donors, with **$1.5 million specifically for the Panov Program**. Our work will bring together top clinical minds in surgery, genetics and advanced diagnostics; basic science researchers in personalized medicine at Mount Sinai's Lunenfeld-Tanenbaum Research Institute; global cancer leaders in top centres in Canada and the United States; private partners; and MSH allied leaders in laboratory medicine, radiology and imaging to address key research questions:



- Can we identify specific **genetic mutations** linked to soft tissue sarcoma that can be specifically targeted with today's new personalized molecular drugs?
- Can we identify **drugs with the ability to slow or stop the growth** of various sub-types of soft tissue sarcoma?
- Can we identify genetic abnormalities present in soft tissue sarcoma, and can we determine which individual tumors are at highest risk of spreading, and use bioinformatics (computer computational models) **to inform new approaches to prediction and prevention**?

Our goal is to advance the level of precision with which we are able to predict and diagnose, then attack sarcoma with molecular drugs which target at the precise genetic level. We will combine this knowledge with surgical interventions which enable complex and previously inoperable sarcomas to be safely and accurately removed while sparing as much surrounding healthy tissue as possible.

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