Dana-Farber Cancer Institute

The Jimmy Fund

PROGRESS UPDATE

Bob Parsons Memorial hosted by Shem Creek Capital

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BEST HOSPITALS U.S.News & WORLD REPORT NATIONAL CANCER 2019-20

BEST CHILDREN'S HOSPITALS U.S.News & WORLD REPORT CANCER 2019-20

Dana-Farber Cancer Institute has been the top ranked cancer hospital in New England by U.S. News and World Report for 19 consecutive years, and is ranked in the top 5 nationally for both adult and pediatric cancer programs.

MAGNET RECOGNIZED AMERICAN NURSES CREDENTIALING CENTER

EXECUTIVE SUMMARY

At Dana-Farber Cancer Institute, the **Bob Parsons Fellowship** provides early career researchers with the financial freedom to pursue their curiosity, creativity, and scientific interests in a way that catalyzes extraordinary discoveries in pancreatic cancer. This report highlights the work of the 2019 Bob Parsons Fellow **Ana Babic, PhD,** and our efforts to improve early detection by exploring how metabolism and obesity influence initial pancreatic cancer formation and progression, thanks also to your support through the **Bob Parsons Fund for Early Detection in Pancreatic Cancer Research**.

In addition, your investment in the Patient Assistance Crisis Fund is helping our patients manage the financial burden that can accompany cancer care, whether that be the costs of transportation, food, or other basic necessities. Your gift has played a critical role in supporting their care. Thank you for your vision and generosity in helping to advance this important work.

Ana Babic, PhD

EARLY DETECTION: GETTING AHEAD OF A DIFFICULT DISEASE

Metabolites could play powerful role in risk prediction

With few early symptoms and no large-scale screening programs, pancreatic cancer is often caught at a late stage when treatment options are not curative. Detecting the malignancy at its emergence is key to successfully managing the disease and improving overall outcomes. Babic is working with **Brian Wolpin, MD, MPH**, to identify pancreatic cancer risk factors and early disease biomarkers (see sidebar) that could contribute to the development of a stronger risk prediction model.

Previously, Wolpin identified signs of early pancreatic cancer by studying blood samples from large research cohorts such as the Nurses' Health Study and the Health Professionals Follow-Up Study (see sidebar). Importantly, he was able to obtain samples from participants who went on to develop pancreatic cancer. The metabolites found in their blood samples—collected up to 20 years before diagnosis—differed from those who never developed the disease. The former group had elevated levels

Biomarker: short for "biological marker," these act as measurable signposts of a normal or abnormal process, or a condition or disease. Biomarkers can sometimes be used to predict treatment outcomes and, thus, guide clinical decisions.

Nurses' Health Study: an investigation into women's health launched in 1978, making it the longest running study of this cohort. The investigation explores the risk factors for major chronic diseases in women, including how factors such as diet and lifestyle relate to illness.

Health Professionals Follow-Up Study: a complement to the Nurses' Health Study, this investigation was launched in 1986 to track men's health.

of branched-chained amino acids, which researchers later found were released into the blood by wasting of muscle tissue, a common symptom of pancreatic cancer.

Building on this work, Babic is studying blood samples from patients who developed pancreatic cancer six months to seven years after the draw. This time span is considered the prime window for early detection. She discovered that nine metabolites had significantly different levels in healthy people and future pancreatic cancer patients. Taken together, the presence of these nine metabolites could contribute to a potential risk prediction tool that could be used to follow individuals at high risk for developing pancreatic cancer, such as smokers, those with pancreatitis, and those with a family history of the disease.

As a next step, Babic is validating this work in larger and independent populations. Additionally, she plans to work with mouse models to better understand why these particular metabolites seem to correlate with pancreatic cancer risk.

HOW BODY COMPOSITION IMPACTS OUTCOMES

A look at obesity's role in pancreatic cancer

Prior work by Wolpin found that obesity has a negative impact on outcomes for patients with pancreatic cancer. To better understand the role of obesity in pancreatic cancer progression, Babic is evaluating several different datasets:

- Imaging data of different types of adipose, or fat, tissues
- Blood levels of several obesity-associated biomarkers
- Protein expression in tissue samples from obese patients; and
- Mutational profiles in the tumors of obese patients.

While this work is still ongoing, Babic has found early evidence that elevated levels of inflammation, which are known to be present in obese individuals, in the pre-diagnostic period lead to significantly shorter patient survival. These results indicate that the negative effect of obesity on prognosis can be partially explained by elevated inflammation. These

results suggest that targeting inflammation might be beneficial for patients with pancreatic cancer.

A closer look at cachexia

Pancreatic cancer is frequently associated with cachexia, a tissue wasting syndrome that has been correlated with poor survival. To better characterize the role this condition plays in patient outcomes, and to potentially identify biomarkers that flag high-risk patients, Babic studied blood samples and CT scans from 164 patients with advanced pancreatic cancer. Using the CT scans, she measured their adipose tissue and muscle tissue at the time of diagnosis and then 50-120 days later. While patients lost both adipose and muscle tissue after diagnosis, only muscle loss was correlated with poor survival; the loss of adipose tissue had no impact on survival. Crucially, she also found a biomarker that correlated with future muscle loss: low levels of MCP-1. This protein could be used to help identify a high-risk group of patients who would benefit from monitoring for muscle wasting and targeted interventions to increase muscle mass. These findings were published in the September 2019 *Cancer Epidemiology, Biomarkers & Prevention*.

PATIENT ASSISTANCE CRISIS FUND HELPS WEATHER A STORM

The ongoing costs of cancer care can add up and precipitate a crisis, such as homelessness or the inability to handle a costly emergency. In these cases, Dana-Farber Resource Specialists can tap into the Patient Assistance Crisis Fund, which provides up to $1,000 per year to eligible patients who face significant stress that threatens their treatment or recovery. These examples illustrate the important impact of this philanthropically funded resource.

Jasmine

When Jasmine, a patient in her 30s, was laid off, she immediately found a better job—and then she learned she had cancer. Now on a leave of absence as she undergoes treatment, this resilient young woman is eager to return to work as soon as possible. In the meantime, Jasmine was unable to pay her rent and, when her landlord issued a 14-day eviction

notice, she found herself on the brink of homelessness. The Patient Assistance Crisis Fund helped her pay her rent while a Resource Specialist helped connect her to the local housing authority for further assistance.

Lawrence

Lawrence, a patient in his early 60s, received a grant from a foundation to cover the copayment costs for his cancer drugs. When the grant ran out, Lawrence found that he was ineligible for assistance from the pharmaceutical company until he paid down his deductible, something he could not afford to do. The Patient Assistance Crisis Fund covered his prescription copayment, allowing him to meet his deductible and continue taking his medication uninterrupted.

Pete

Ten years after his first treatment, Pete, now in his 30s, was diagnosed with a new form of cancer. Pete and his wife, a stay-at-home mom, have a baby and kindergartener. To keep his short-term disability benefit with his employer, Pete continues to work as often as he can. When the young couple's furnace broke in the middle of the winter, they did not know where to turn. The Patient Assistance Crisis Fund helped the couple purchase a new furnace, ensuring that they had heat during the coldest months of the year.

THE POWER OF PHILANTHROPY

Your support of the **Bob Parsons Fellowship** and the **Bob Parsons Fund for Early Detection in Pancreatic Cancer Research** is driving pancreatic cancer studies by early career physician-scientists who have the vision and dedication to tackle one of the most intractable issues facing pancreatic cancer researchers: early detection. Your compassionate partnership is also forwarding our efforts to ensure that all patients—regardless of their economic situation—can receive the quality care and treatment that Dana-Farber offers. Philanthropy such as yours is critical to the future of our mission, and we are deeply grateful for your friendship and support.

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FOR MORE INFORMATION

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10% of all designated gifts will support our Faculty Research Fund to advance Dana-Farber's research mission.