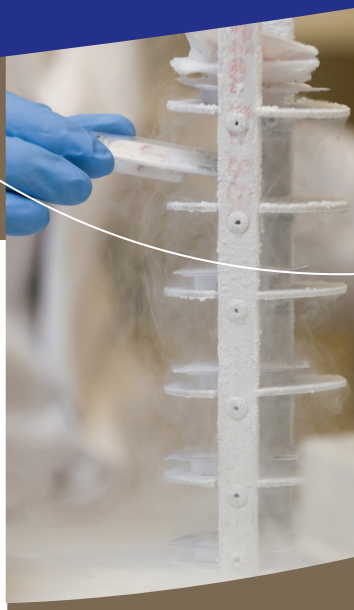
Spring 2016 Issue 09-R

Tumour Tissue Repository

A provincial resourse to support translational cancer research at the BC Cancer Agency, nationally & internationally

BC Cancer Agency
CARE + RESEARCH
An agency of the Provincial Health Services Authority

The TTR provides researchers access to one of the largest collections of cancer biospecimens and data available in Canada for retrospective studies



The BCCA Tumour Tissue Repository: Biobanking Fuel for Your Research

Many researchers need access to large numbers of high quality biospecimens. For example 40% of all cancer publications depend in some part on human biospecimens for data. The TTR offers researchers access to preassembled collections and can conduct 'collected to order' prospective collections for specific studies.

Access to Retrospective Biospecimens

The TTR holds over 5000 cases (tissue, blood, and data) carefully collected under known and standardized protocols and has released over 1000 cases from its 'stock' to a total of 27 research projects. In total, 50 scientific publications have utilized TTR biospecimens and data. Many of these papers have been published in high impact journals like Nature, and elicited citations by the BBC among the top 10 medical discoveries in 2012.
The TTR has standardized review processes that enable it to review applications, estimate user fees, and provide samples to researchers efficiently. Response time was approximately 60 days from the time a researcher submitted an application for materials/data to the time a decision was reached and samples released.

Setting-up Prospective Biospecimen Collections

The TTR works one-on-one with researchers to help them collect their own biospecimens using study specific protocols by:

- Providing protocol development support (e.g. communicating with and educating hospital and clinical staff about referrals to specific research projects, assisting with REB applications, etc.),
- Providing information on potential study participants (e.g. patients who have provided permission to contact to consider consenting to future specific studies)
- Carrying out the active enrolment of participants to prospective studies – (e.g. obtaining consent and tracking patients over time).
- Collecting biospecimens and information about each specimen under the specific conditions and criteria required for each project.

Currently Collecting Biospecimens for the following Research Projects:

CEF-OV Project-Oncolytic Viruses enhance immune response against cancer

Investigators: Dr. Kwame Twumasi-Boateng Ph.D & Dr. Brad Nelson Ph.D
Biospecimens collected by the TTR: Effusions and blood from a range of cancer patients. TTR also consents patients for the study.

This project uses oncolytic viruses (OVs) designed to only grow in cancer cells to enhance the immune response against tumors. Common immune responses against the CEF viruses are re-directed to kill cancer cells (CEF viruses: C- Cytomegalovirus (CMV), Epstein Barr Virus (EBV), and the Flu (F) viruses). Fluids from thoracenteses and paracenteses, and blood biospecimens are used by researchers to develop and optimize these cancer-selective viruses in order to to develop new therapies to enhance the immune response and survival outcomes of cancer patients. Currently oncologists refer appropriate patients to the TTR to participate in this project, and samples and clinical information are collected at the BCCA Vancouver Island Centre (VIC).

TIL-ISS Project- Determining the signaling properties of tumor infiltrating lymphocytes using a novel method of in situ stimulation (TIL-ISS)

Investigators: Nicole S. Little M.Sc Student & Dr. Brad Nelson Ph.D
Biospecimens collected by the TTR: Fresh tumor tissue collected in PBS- mostly from breast, colorectal and lung surgeries.

The study aims to identify the immune cells within a tumor that are capable of responding to various immunological stimuli. By treating live fragments of tumor with various molecules that stimulate the immune system, researchers hope to identify where anti-tumor immune cells are located in the tumor. This will provide more insight into how the immune system and tumor interact, and could ultimately lead to improved immunotherapies for cancer.

PVAX Project- A personalized prostate cancer vaccine

Investigators: David Nielsen M.Sc Student, Jennifer Kalina B.Sc & Dr. Julian Lum Ph.D
Pathologist: Dr. Davide Salina and Dr. Mildred Martens

To access biospecimens or if interested in setting-up a prospective collection contact us:

ttr@bccancer.bc.ca

TTR Office
(250) 519-5713
1.866.898.0887

www.bccrc.ca/dept/ttr

Biospecimens collected by the TTR: Fresh tissue from fine needle biopsies from the radical prostactetomies.

The majority of occurring mutations tend to be patient specific, it is rare to find ones that afflict all patients. Hence, patient specific immunotherapy in the form of a personalized vaccine is a feasible alternative for treating prostate cancer. Using next-generation sequencing, PVAX will identify if the high frequency of gene fusions and spliced isoforms in prostate tumors can serve as immune targets for high risk prostate cancer patients, with the end goal of developing a vaccine for prostate cancer. PVAX participants are recruited by BCCA Vancouver Island Centre Oncologists and consented to the project by the PVAX team, and the TTR provides support with just the biospecimen collection. Biospecimens are currently being collected for the project with the help of pathologists and the Surgical Offices of Urologists in Victoria.

Publication Highlight from January 2016- Retrospective Biospecimens accessed via TTR:

Activation of an endogenous retrovirus-associated long non-coding RNA in human adenocarcinoma.

Gibb EA, Warren RL, Wilson GW, Brown SD, Robertson GA, Morin GB, Holt RA.

We identified the tumor-specific expression of a novel long non-coding RNAs (lncRNA) that we have named Endogenous retroViral-associated ADenocarcinoma RNA or 'EVADR', by analyzing RNA-seq data derived from colorectal tumors and matched normal control tissues. Subsequent analysis of TCGA RNA-seq data revealed the striking association of EVADR with adenocarcinomas, which are tumors of glandular origin. Moderate to high levels of EVADR were detected in 25 to 53% of colon, rectal, lung, pancreas and stomach adenocarcinomas (mean = 30 to 144 FPKM), and EVADR expression correlated with decreased patient survival (Cox regression; hazard ratio = 1.47, 95% confidence interval = 1.06 to 2.04, P = 0.02). In tumor sites of non-glandular origin, EVADR expression was detectable at only very low levels and in less than 10% of patients. For EVADR, a MER48 ERV element provides an active promoter to drive its transcription. Genome-wide, MER48 insertions are associated with nine lncRNAs, but none of the MER48-associated lncRNAs other than EVADR were consistently expressed in adenocarcinomas, demonstrating the specific activation of EVADR. Our results describe the specific activation of a highly conserved ERV-lncRNA in numerous cancers of glandular origin, a finding with diagnostic, prognostic and therapeutic implications.

Genome Med. 2015 Mar 5;7(1):22. doi: 10.1186/s13073-015-0142-6. eCollection 2015.

Biobanking publications

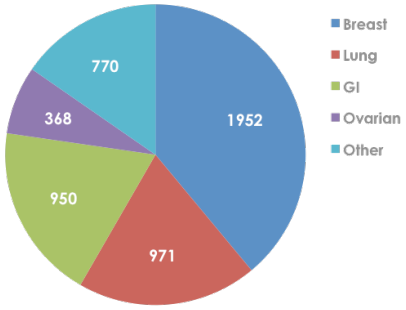
To date TTR members have also published 29 papers on biobanking; below are two published in 2015:

Meredith AJ, Slotty A, Matzke L, Babinszky S, Watson PH. A Model to Estimate Frozen Tissue Collection Targets in Biobanks to Support Cancer Research. Biopreserv Biobank. 2015 Oct;13(5):356-62. doi: 10.1089/bio.2014.0081. Epub 2015 Sep 29.

Matzke LA, Fombonne B, Watson PH, Moore HM. Fundamental Considerations for Biobank Legacy Planning. Biopreserv Biobank. 2016 Feb 18. [Epub ahead of print]

Accrual

Over 5000 participants have consented to the TTR since its inception in 2003. The chart on the right shows the proportion of consented patients based on cancer type. 84% of patients approached agree to participate in TTR. It is thanks to these participants that scientists can access the critical biospecimens fueling cancer research. The TTR collects frozen and FFPE tissues, blood samples and health data on all cases.

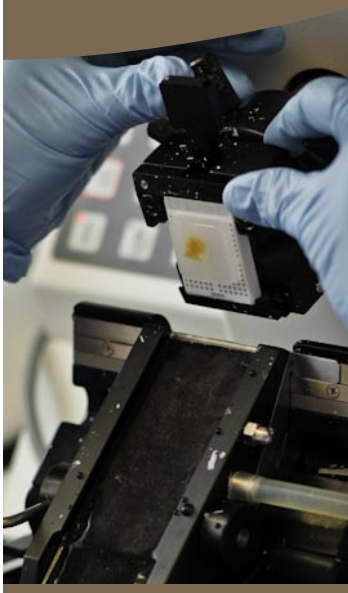


The TTR- Biobank Resource Centre (BRC)

The resource center was established in 2011, and supports both researchers and biobanks in conducting better quality biobanking by advising, consulting, educating; and creating, improving and disseminating biobanking standards that will enhance the quality of scienti c research. Together with colleagues in the Canadian Tissue Repository Network (CTRNet) it created the 1st ever Registration and Certification Program for biobanks in North America- enhancing research access to tissue resources by creating a register of biospecimen collec- tions. To date the BCCRC Dept heads and BCCA Research Council have endorsed adoption of the Registration Component within BCCA, and the BC Health Research Council has struck an advisory group to consider models for implementation across BC. BRC is working to implement the program internationally with the New South Wales Health Pathology in Australia, and with the National Institute of Pathology in New Delhi, India. Also currently adapting the Certification Program for the national clinical trials infrastructure program (3CTN). It collaborates continuously with other CTRNet nodes in Alberta, Manitoba, Ontario and Quebec, as well as with the UBC Faculty of Medicine and the Department of Pathology.

For more information and resources please visit www.biobanking.org/

THANK YOU TO OUR FUNDER, SUPPORTERS & AFFILIATED ASSOCIATIONS



The TTR is grateful for the continued support and generosity of patients, surgeons, anatomical pathologists, their clinical and administrative groups, and the hospital personnel in Victoria and Nanaimo.

Dr. Peter Watson, TTR and OBER Director

The TTR Team:
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OBER TTR team:
Stefanie Cheah, Simon Dee, Lise Matzke, Anna Meredith, Alex Slotty, Sheila O'Donoghue

All photographs courtesy of Juzer Kakal