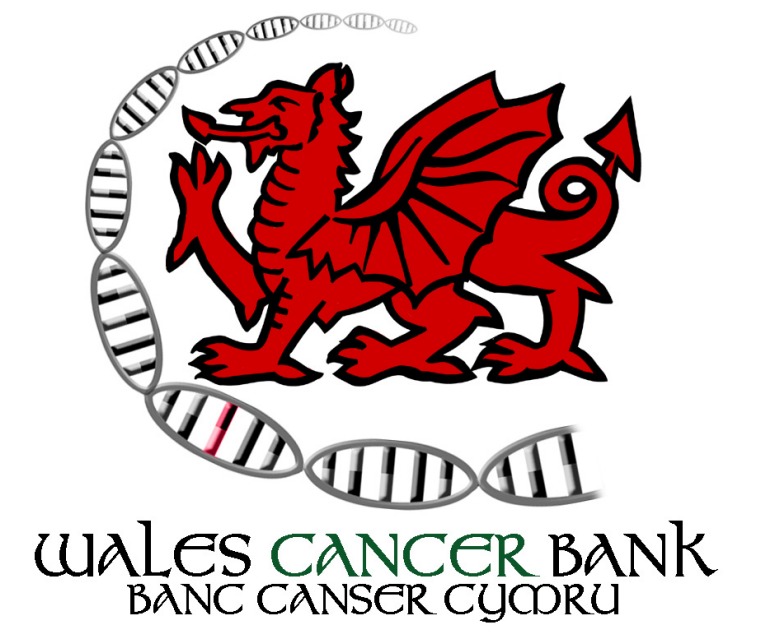


The Wales Cancer Bank (WCB)



Background

The Wales Cancer Bank (WCB) was established in 2004 to ask cancer patients in Wales to consent to donate tissue and blood samples to be made available for future, cancer related research. WCB is licensed by the Human Tissue Authority (licence 12107) to collect and store human tissue for research and is approved as a Research Tissue Bank by Wales REC3. Over 15,000 patients from 13 hospitals around Wales have, to date, consented and their samples have supported research projects around the world.

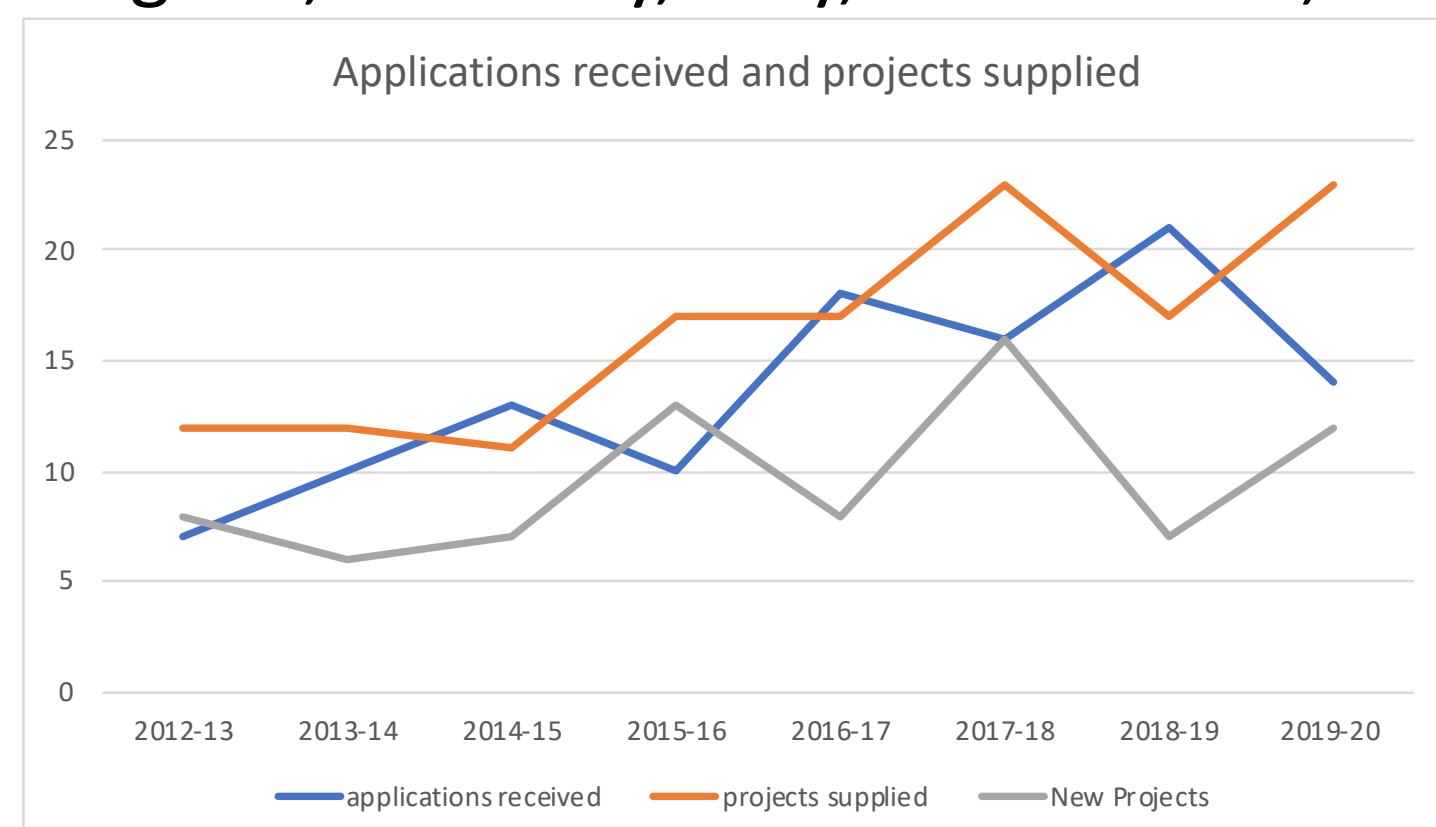
The WCB works with the NHS around Wales to give patients the opportunity to take part in research by donating samples and data. WCB is funded by Health and Care Research Wales as an Infrastructure Group and has funding until March 2025. WCB is the Cardiff Clinical Hub for the CRUK Stratified Medicine Programme and works closely with Cancer Research Wales and Velindre Cancer Centre.

Sample Issue

The Wales Cancer Bank (WCB) has ethics approval to issue biosamples and data to researchers following an approved review process. WCB has an open access policy – researchers from around the world and working in any sector can apply for samples for cancer related research. The samples available from WCB are included on sample locator portals such as the UKCRC Tissue Directory and the BBMRI-ERIC locator and WCB is part of the Scientist.com platform as a supplier of human biological samples.

An international panel (remotely) reviews all applications for samples to WCB and provides recommendations to the WCB regarding supply. A member of the WCB's Lay Liaison and Ethics group assesses the submitted lay summaries to ensure plain English. A cost recovery model is applied to all applications and researchers are requested to acknowledge WCB in papers. A doi is provided to link to details of the WCB processes (<http://doi.org/10.5334/ojb.46>) in the Open Journal of Bioresources.

Over 25,000 samples have been used from WCB in research in the UK, Ireland, Spain, Belgium, Germany, Italy, Switzerland, S Korea and Canada.



A dedicated member of the WCB team works with applicants from the initial enquiry to ensure that the samples supplied will be fit-for-purpose and relevant for the research. New sample pipelines have been initiated to support researchers' requirements such as fresh tissue collections for organoid and xenograft work and ethics amendments have been submitted to include elements of research projects such as questionnaires or fasting requirements. In April 2020 WCB amended their ethics approval to provide samples for Public Health Emergencies to be able to support ongoing COVID19 related work. Serum samples were provided to two companies to use as control samples in work to develop diagnostic tests.



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www.walescancerbank.com



www.facebook.com/thewalescancerbank



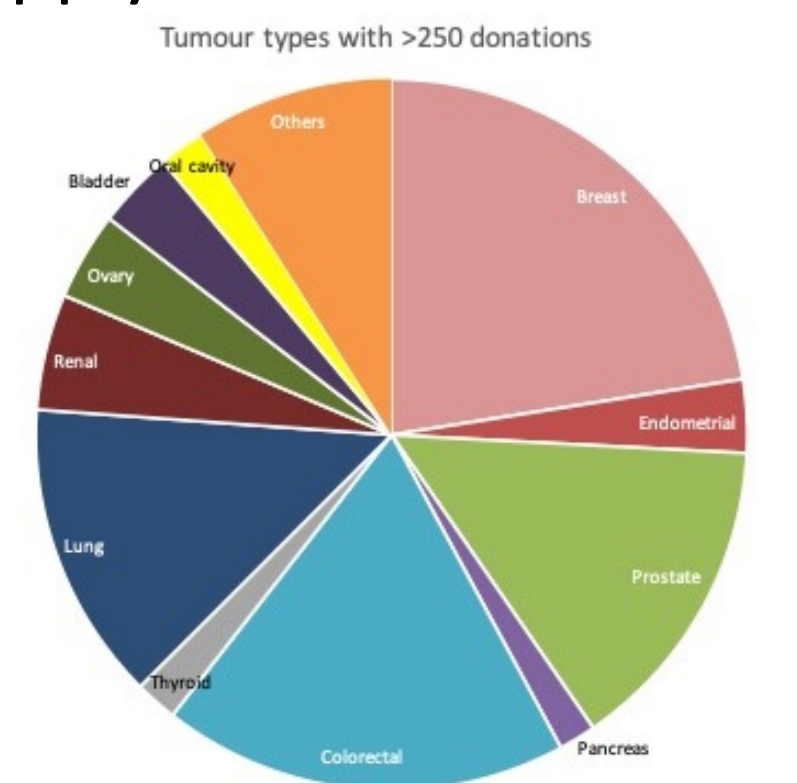
twitter.com/walescancerbank



Samples available

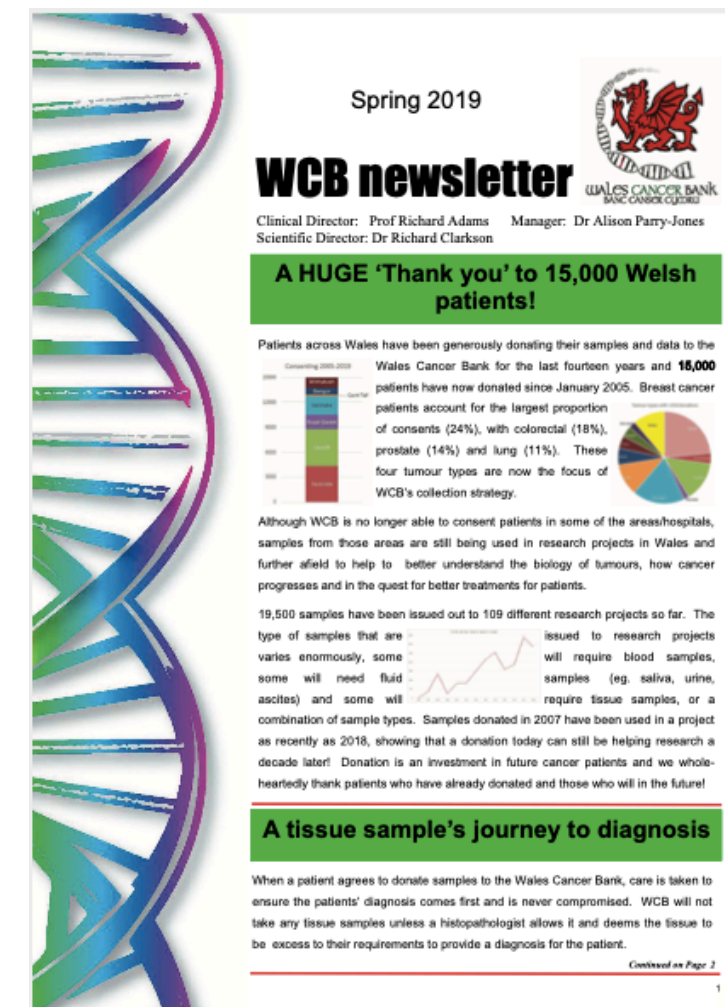
The WCB collects sample sets whenever possible:

- Fresh tissue (tumour and adjacent normal) – either to supply as fresh or to freeze
- FFPE tissue (tumour and adjacent normal)
- Whole blood
- Serum
- Plasma
- Other fluids (ascites, urine, saliva)



Data provided:

- Basic data set of age at diagnosis, gender, diagnosis, stage/grade
- Histology data
- Molecular data (where available)
- Treatment and outcome data (Clinical data)



Other services available:

- Digital imaging and images available for applications
- TissueMicroarrays
- Clinical Trial sample hosting
- Consultation on project design/sample requirements
- Optimisation of methodologies

Data

Patient consent is recorded on an NHS Cancer system and anonymized data is linked to the WCB's bespoke, in-house tracking data system. The system allows input of all data relating to the sample (pre-analytic fields, processing information etc) as well as pathology data and clinical data. The samples are identified via a 2D and readable barcode and all movement of samples is scanned to reduce input error. The database system also tracks applications and supply and has audit tools and an incident reporting system. The inventory links to a online sample search on the WCB website: <https://www.walescancerbank.com/online-search.htm>

Lay involvement

The Wales Cancer Bank has involved lay members from its inception and an active Lay Liaison and Ethics group continues to advise on all aspects of the operation of the biobank. The Chair of the Lay group is part of the WCB Executive group and attends Advisory Board meetings. The Lay group have had input into:

- Patient information sheets
- Consent forms
- Introduction of lay consenters (trained members of the public consent patients for WCB in the tertiary cancer centre)
- Introduction of iConsent
- Review lay summaries in applications
- Website

The lay consent programme received second place in the Health and Care Research Wales Public Involvement and Engagement Awards in 2018.

Engagement

- WCB produces newsletters to inform patients, the public and researchers of activity and updates.
- The website is updated regularly with information on projects supplied with samples
- WCB takes part in public events, such as an event in Techniquet, Cardiff in March 2020 where a pathologist showed examples of slides and described the diagnostic process and we played a game of histology H&E twister!

Case Study - Setting up a fresh tissue pipeline for organoid research

This project was the first application to WCB to request fresh tissue. Working with the colorectal surgeons, the pathologist and the researchers WCB formulated a pathway that ensured the integrity of the tumour for diagnosis as well as the rapid supply of the tissue to the researcher. WCB staff were on call to retrieve the specimen from theatre and transport immediately to pathology, where the pathologist allocated a portion of tissue for research. Communication with the researcher was key to ensure minimal sample turnaround time and the use of a suitable culture media for transportation. WCB also supplied this project with genomic DNA extracted from whole blood samples.

The research '3D Imaging of colorectal cancer organoids identifies responses to Tankyrase inhibitors' was undertaken by researchers in Cardiff University and the study highlights the value of phenotypic readouts as a quantitative method to assess drug-induced effects in a relevant preclinical model. The researchers generated CRC patient-derived organoids and studied their responses to Tankyrase inhibitors (TNKSi). Using metabolic end point assays, tankyrase inhibition showed partial efficacy, reflecting a limited reduction in the growth of TNKSi-sensitive organoids. Closer examination of organoid responses suggested that TNKSi altered the ratio of stem-like to differentiated cell populations. This subtle effect on the cellular composition of organoids was best reflected by multiparametric imaging analysis of organoids that was nonetheless compatible with high throughput analysis. The findings demonstrate the potential of a phenotypic approach to assess drug-induced phenotypes in a preclinical setting, which may be applicable to a wider range of therapeutics that target cancer stem cell biology and niches. The study was published in August 2020.

The establishment of this pathway laid the foundations for similar bespoke collections in prostate, lung and breast for supply to local research groups. The use of samples for xenografting projects necessitated an amendment to ethics and the drafting of xenograft specific information sheet and consent form. At least half of the sample requests are now for fresh samples.

3D imaging of colorectal cancer organoids identifies responses to Tankyrase inhibitors

Luned M. Badger, Andrew J. Hollins, Bram Herpers, Kuan Yan, Kenneth B. Ewan, Mairian Thomas, Jennifer R. Shone, Delyth A. Badger, Marc Naven, Kevin E. Ashelford, Rachel Hargest, Alan R. Clarke, Christina Esdar, [...], Trevor C. Dale

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