

Translational Research and Sample Handling

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Introduction

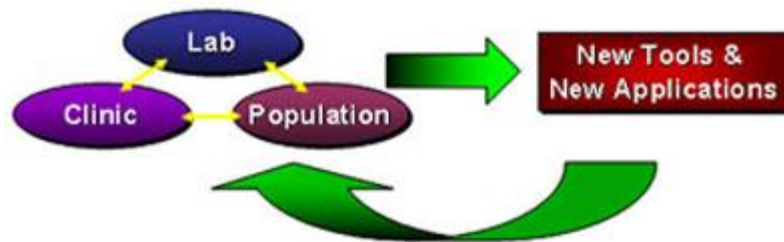
- What is Translational Research
- Why do we do it?
- Some basic terms
- Sample handling
- Bloods
- Tissue
- Other samples
- Nurses responsibilities
- Summary



What is Translational Research?

The Translational Research Working Group (NCI) defines Translational Research in the following way:

"Translational research transforms scientific discoveries arising from laboratory, clinical, or population studies into clinical applications to reduce cancer incidence, morbidity, and mortality."



Stand Up 2 Cancer (SU2C)

“Translational research can be pictured in the following way,” explains Nobel prizewinner Phillip Sharp, PhD, in an interview with Stand Up2Cancer. “I have a scientific insight. I develop a drug for that scientific insight, or a new therapeutic approach . . . You have to find the cancer patient who would respond to this drug, and you have to deliver it to that cancer patient in a compassionate and reasonable way to see if you can get maximal response.”



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SU2C

Makes sense, right?

Then why is so much of the current research on cancer restricted to the lab bench?

In order to get effective therapies to patients quickly, there must be more support for the next step of the process – the step wherein basic science is translated into lifesaving treatment.



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Translational Research

- Translational research involves moving knowledge and discovery gained from the basic sciences to its application in clinical settings.
- This concept is often summarised by the phrase "bench-to-bedside" research.
- Brings the scientists ideas into reality (quickly).
- Often find translational research bolted on to studies alongside the traditional PK and PD studies.
- Vital part of the Trial, not just an extra blood or tissue sample.
- Often looking for biomarkers



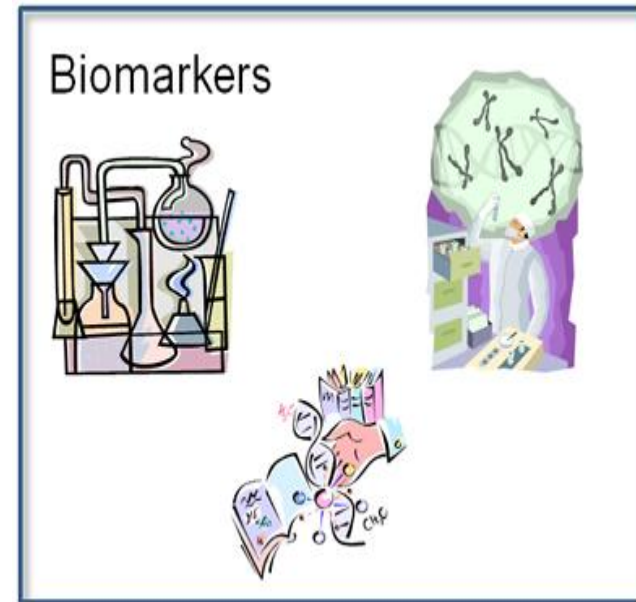
Biomarkers

Biomarkers can be used to tell if:

- Treatment working
- Treatment stopped working
- Monitoring

May be from:

- Bloods
- Tissues
- Imaging



PK, PD

Recap from this morning:

Pharmacokinetics: **PK** is the study of what the human body does to drugs to get the drug out of the body

Pharmacodynamics: **PD** is the drugs effect on the body and tumour

PG, BM

Pharmacogenetics: **PG** is the study of genetic differences in metabolic pathways which can affect individual responses to drugs

Biomarkers: **BM** is a measurable indicator of 'biological state' and are often measured and evaluated to examine biological processes or pharmacologic responses to a drug or treatment.



Sample Handling

- Bloods
- Tissue
- Nurses responsibilities
 - Training
 - Recording
 - Chain of custody / Material Transfer Agreement
- Summary



Bloods –Top Tips

- If you use the laboratory or even handle samples - YOU MUST BE TRAINED!
- Ask at protocol development stage
- Understand the different tubes, especially if supplied by drug companies – Sarstedt and Monovettes use different systems and different colour tubes. Train on the correct system
- Understand what component of blood is required – it's vital to the research
- Centrifuges are individual and tricky and protocols need to be followed!
- Rubbish in = Rubbish out





Bloods stored in glass tubes which were overfilled and frozen

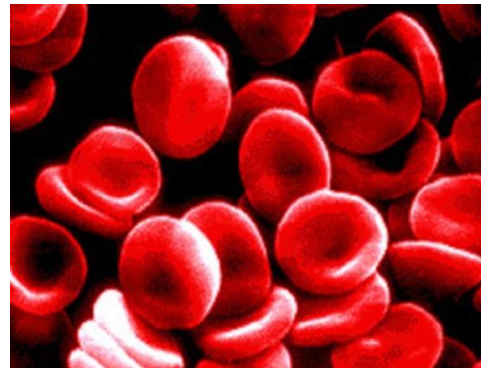
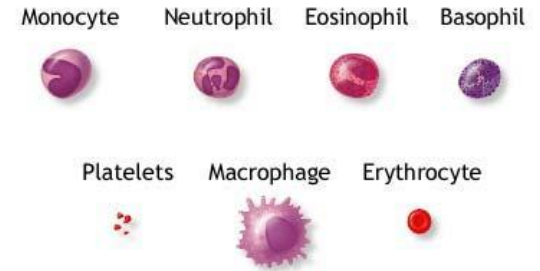


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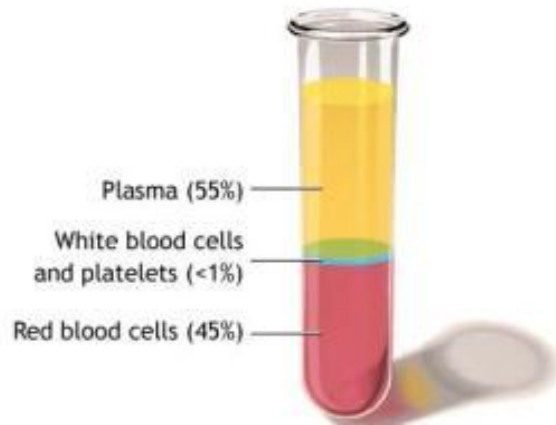


Blood Components

- Red Blood Cells
 - used to carry Oxygen
- White Blood cells
 - used to fight infection
- Plasma
- Serum



Blood components after centrifugation



Plasma

Serum



Difference between Plasma and Serum

- Plasma contains fibrinogen and is the liquid (cell free after centrifugation) part of the blood
- Serum is the liquid part of blood after coagulation, and therefore has no clotting factors such as fibrinogen.

WARNING – both look identical after centrifugation!



Tissue

- Formalin Fixed Paraffin Embedded tissue
 - FFPE
 - Blocks
 - Archived tissue
- Fresh tissue
 - Liquid Nitrogen
 - RNA-Later
- Many studies now ask for one or both of these



Nursing Responsibilities

Training

- Everyone needs training
- Lab equipment is dangerous if used incorrectly (and expensive when it breaks)
- Hazardous substances (LN2) – know your COSHH (control of substances hazardous to health)
- Correct use and handling of blood bottles, tissue samples



Nursing Responsibilities

Recording and storage

- Accurate recording of samples is the most important part of sample collection
- Document to the minute
- Don't 'guestimate'
- Document on the spot
- Rubbish in = Rubbish out
- Storage should be correct for the sample and monitored



Nursing Responsibilities

Chain of Custody / Material transfer Agreements

- Check Consent
- Check everything is logged
- Ensure a MTA is in place
- If you can't find the correct agreements don't send it
- HTA will come calling
- Shipment must be correct for the sample (dry ice etc)



Summary

- Samples are an important part of early phase and translational research
- We can never go back to the same time point to get a missed/incorrect sample
- Know your responsibilities and get trained
- Document everything!

Remember – the patients want to take part in these studies and donate the samples to help this and future research. It is our responsibility to ensure we do the best we can with these precious samples



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