Understanding Micro-CT Scanning

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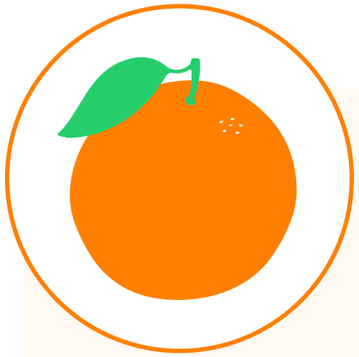
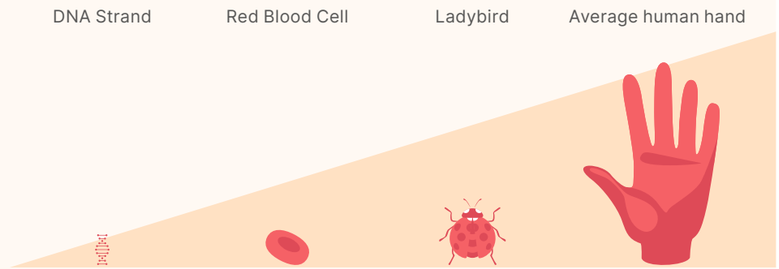


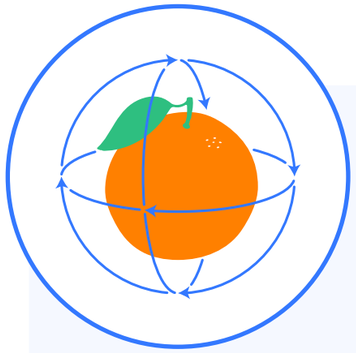
What Is It?

Microfocus CT utilises X-rays to see, slice-by-slice, within an object.

Similar to regular CT scanning, but on a smaller scale with higher resolution.

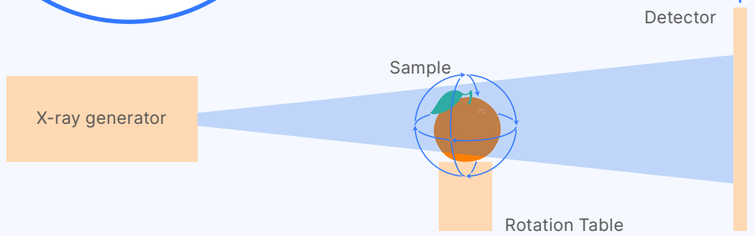
- Samples can be imaged with pixel sizes as small as **100 nm**.
- Objects can be scanned as large as **200 mm** in diameter.





How Does It Work?

- X-rays are emitted from an X-ray generator.
- These travel through the sample.
- A detector on the other side records these to produce a radiograph.



- The sample is then rotated by a fraction of a degree, and another projection image is taken.
- This process is repeated until the sample has been rotated either 180 or 360 degrees, producing a series of projection images.

Benefits

- This gives radiologists the ability to distinguish between materials of different densities.
- Non-destructive, which means that the sample can be preserved for any reason.
- Concerns have been raised regarding the harmful impact of X-rays on genetic material; however, studies have shown no damage thus far.

Applications of Micro-CT

Perinatal autopsy

- This is a recent use of micro-CT, but one which shows a lot of promise.
- Useful for imaging early gestational fetuses, as they are very small.
- Non-invasive, therefore less distressing for the parents when seeing their child.
- Gives an indication as to whether a full autopsy is needed.
- Imaging feasibility as low as 7 weeks' gestation has been reported.

Evaluation of bone quality, structure, and microdamage

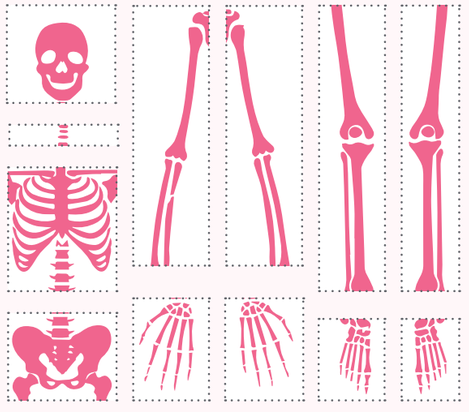
- Micro-CT imaging can assess the strain associated with the damage.
- Can be used to study metabolic bone diseases, such as osteoporosis.
- Can additionally be used to test the efficacy of anti-resorptive and anabolic therapeutics for such diseases.

Complex dismemberment

- Non-destructive and clear visual representation of the skeletal wounds.
- Leads to shorter investigative process in court cases.

Bone remodelling and adaptation

- This may go on to help cases of strain and fracture of bones.



Approximate locations of the dismemberment sites

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