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Human DNA and RNA viruses: life cycle, negative stained and thin-section.

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The presentation was joint because Bart was able to demonstrate biopsy material of common viruses and Barry was able to demonstrate the same of some of the more exotic and virulent types. In addition Barry has experience of looking at negatively stained viruses. Cultured viruses were also looked at.

Viruses examined by different electron microscopical techniques with knowledge regarding their lifecycle can provide valuable insights as to their morphology and likely identity. Practical points to bear in mind are: in diagnostic cases in thin section it is easier to spot small viruses if the sections are cut at 50nm and are stained twice. One should have a differential diagnostic list to work through so as to concentrate on looking for particular viruses in particular places at an appropriate magnification, i.e. if one knows which viruses can replicate in which cells it can rule out the possibility of many others.

As a general rule:

1. RNA virus replication takes place in the cytoplasm – the exceptions are: Influenza which has part of the cycle in the nucleus, Measles ribonucleoprotein can accumulate both in the cytoplasm and in the nucleus, retroviruses whilst part of their cycle occurs in the nucleus this isn't visualised.
2. DNA viruses replicate in the nucleus, with the exception of Poxviruses.
3. Enveloped viruses bud through membranes – non-enveloped viruses exit by cell lysis.
4. Cells showing cytopathic effect including multinucleation can be devoid of assembled viruses due to host genomic integration or lag phase cell resolution following virus elimination.

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