1

Sample Preparation

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Chapter summary

This chapter has provided guidelines for optimal sample preparation ahead of molecular analysis. These are given in the context of the handling of cells and tissue for subsequent protein and nucleic acid analysis.

- All samples degrade due to the effects of ischaemia leading to autolysis and, in a non-sterile environment, putrefaction. Sample integrity can also be compromised by chemical interactions, such as formalin fixation and physical handling, as can be caused by inappropriate freezing of tissue. Consequently, to avoid compromising subsequent analysis sample preparation needs to be carefully controlled.
- Pathways for sample preparation vary according to the sample type and its analytical destination. Samples such as blood and cultured cells are amenable to standardized preparation. By contrast, surgical resection samples can present a challenge due to their bulk and the non-uniform effects of ischaemia exacerbated by the subsequent influence of FFPE.
- Once samples have been stabilized via an appropriate initial handling procedure they should be assessed for quality and, as appropriate, for concentration before analysis. A variety of methods by which this may be done ahead of intact or homogenate analysis are presented.
- When samples are not to be immediately analysed or residual material is available then these must be appropriately stored. Options are given that, again, vary according to the sample type.
- By combining an understanding of the underlying principles that influence sample integrity and adopting correct preparation pathways as outlined in this chapter samples should be ready for optimal molecular analysis.