Histochemical staining of tissues

Tissue sections typically exhibit little inherent contrast when examined in brightfield under a microscope, unless special imaging techniques for contrast enhancement is applied. However, many tissue structures have a propensity to react with various chemicals that visualize the intrinsic structure of the tissues. In addition, many tissues emit autoflourescence in certain structures (e.g. trapped red blood cells or deposits of neuromelanins and lipofucsins) if exposed to UV light in a microscope equipped for fluorescence imaging. A wide range of histological techniques has therefore been developed and applied to extract details about the tissues microanatomic compositions, some of which are visualizing general nuclear and cytoplasmic structures.

Offspring routinely employs, on a case-by-case scenario, various histological staining protocols as complements to other, more directed/specific tissue staining procedures (eg. immuno-histochemistry). Some examples of these histological staining techniques are:

- Nuclear counterstains (e.g. hematoxylin, cresyl-violet, DAPI, Neurotrace, propidium iodide)
- Stains binding to fibrillar/aggregated protein (e.g. Congo Red and FSB)
- Silver stains (e.g. Bielschowsky's)
- Iron stains (e.g. Prussian blue)
- Fat stains (e.g. O-Red Oil)
- Lipoproteins (e.g. Luxol Fast Blue)
- Carbohydrates (e.g. Periodic acid-Schiff)
- Collagen fibers (e.g. Eosin)

Examples of these staining procedures are given below in Figure 1.