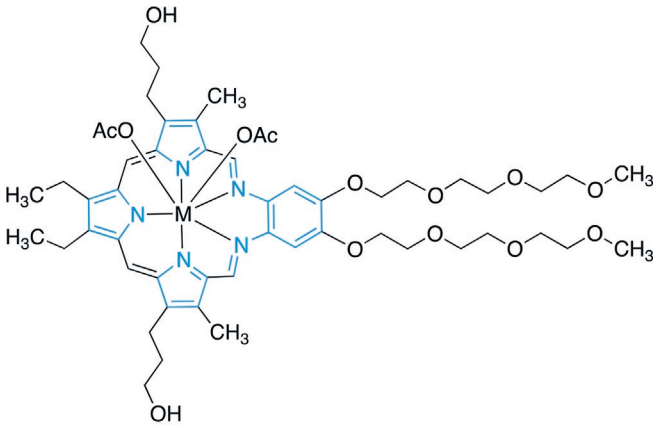
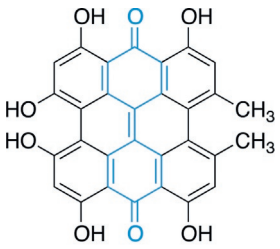
Lutetium texaphyrin (MLu, Lutex®, Lutrin®) absorbs strongly at 730–770 nm, a region with an excellent tissue transparency. This compound has been approved by the FDA for the photodynamic treatment of breast cancer and malignant melanomas. The closely related motexafin gadolinium (MGd, Xcytrin®) has been used in conjunction with whole-brain radiation therapy, leading to improvements in neurocognitive decline and quality of life in non-small cell lung cancer patients with brain metastases.[152] Texaphyrins, especially motexafin gadolinium, have also been developed for use as chemo- and radiosensitisers.[153] Motexafin gadolinium can be viewed as a multitarget anticancer drug because it also behaves as an inhibitor of ribonucleotide reductase.



M = Lu(III) Lutetium texaphyrin (Lutex®, Lutrin®)
M = Gd(III) Motexafin gadolinium (MGd, Xcytrin®)

In addition to their role as photosensitizers, texaphyrins have additional mechanisms of anticancer activity that do not depend on irradiation. They are easier to reduce than porphyrin. Also, in the presence of a variety of reducing metabolites, such as ascorbate, NADPH, thioredoxin, and glutathione, their extended conjugated system can accept one electron, allowing texaphyrins to act as redox mediators and produce ROS in the presence of molecular oxygen, as exemplified in Figure 4.56 for the case of motexafin gadolinium (MGd). Together with the ability to generate oxygen radicals, MGd has been proposed to deactivate the cellular antioxidant system by inhibiting several key enzymes, including the thioredoxin reductase-derived antioxidant system.[138]

Hypericin is a natural extended quinone found in *Hypericum* species (St. John's wort), with a maximum absorbance of 590 nm. It is probably the most potent natural photosensitizer and has been studied for the treatment of a number of tumors.[154]



Hypericin