Axion properties
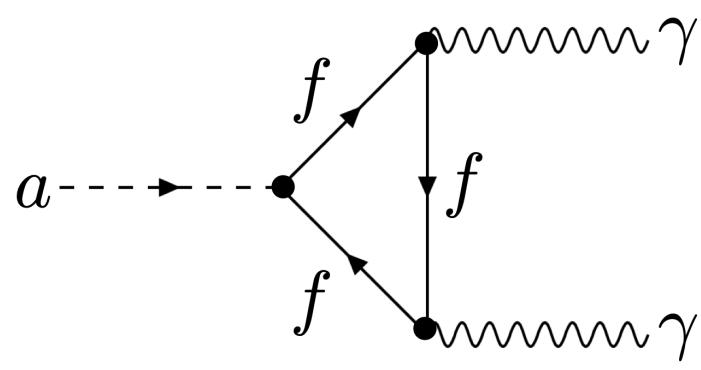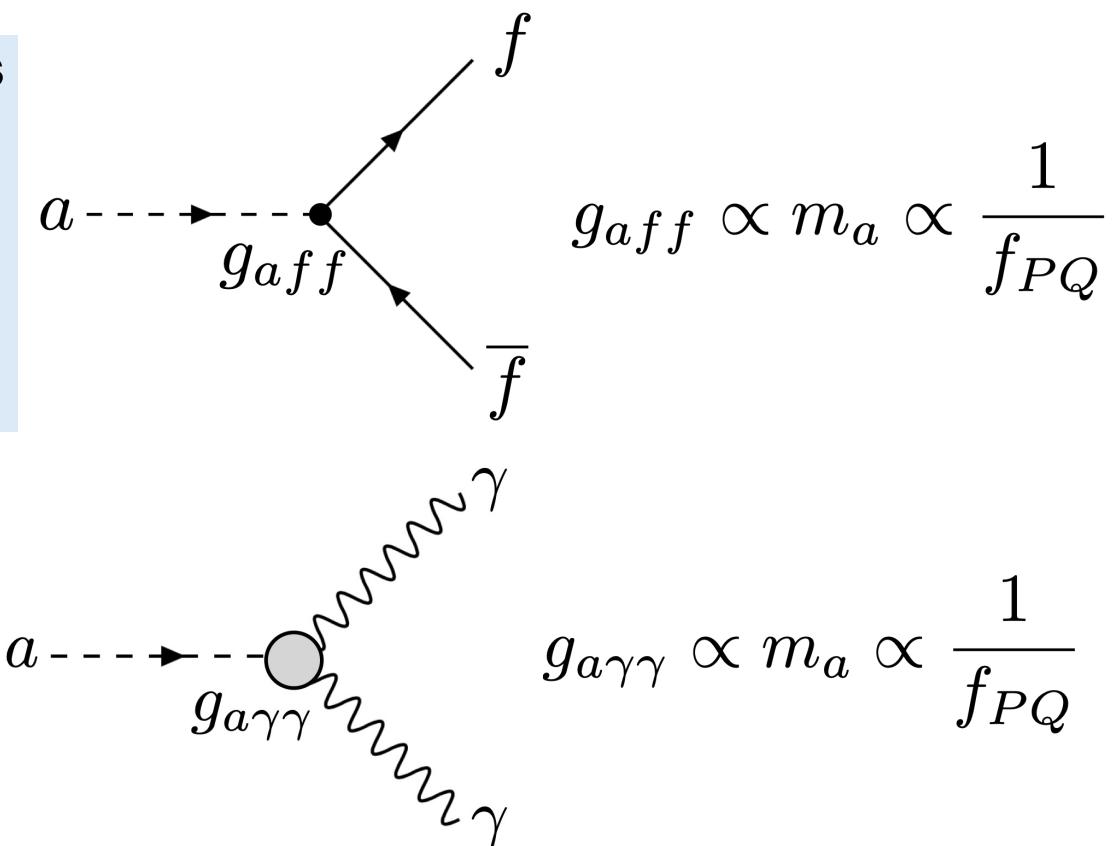
INTERACTIONS [f_{PQ} is the energy scale at the Peccei Quinn phase transition]

The axion has the same quantum numbers as the π^0, therefore there is a scaling rule between axion and pion properties.

$$\frac{m_a}{m_\pi} \simeq \frac{g_{a\gamma\gamma}}{g_{\pi\gamma\gamma}} \simeq \frac{f_{\mathrm{QCD}}(\sim 100\,\mathrm{MeV})}{f_{\mathrm{PQ}}}$$

$$g_{aff} \propto m_a \propto \frac{1}{f_{PQ}}$$

$$g_{a\gamma\gamma} \propto m_a \propto \frac{1}{f_{PQ}}$$