



**Vil radioaktiv stråling under frøutviklingen påvirke avkommets følsomhet overfor stråling ved effekt på antioksidant-apparatet?**

**Will radioactive radiation under the seed development affect the radiosensitivity of the progeny through impact on the antioxidant apparatus?**

The main hypothesis for this work is that seedlings grown from seeds developed under different levels of ionising radiation show different sensitivity to ionising radiation due to rapid adaptation to radiation, possibly through epigenetic mechanisms affecting protective systems such as antioxidants. In preliminary studies we have found that Scots pine seedlings grown from seeds developed under high and intermediate levels of ionising radiation in the Chernobyl region show less DNA damage (DNA strand breaks) after exposure to gamma radiation than seedlings grown from seeds from low, background level radiation. Fig. 1 shows the set-up for gamma irradiation of seedlings and effect of different radiation levels on growth and development in Scots pine.

The specific aim of the MSc thesis work is to try to explain this difference in DNA damage by investigating whether it could be due to different levels of antioxidants and differential expression of antioxidant-related genes. To study epigenetics-related genes will also be highly interesting since an epigenetic memory of the radiation conditions during seed development may be hypothesised. The idea is that the hypothesised difference in the antioxidant apparatus may be due to epigenetic modifications of gene expression, enabling rapid adaptation to radiation.



Fig. 1 a) Set-up for exposure of seedlings in Petri dishes to gamma radiation from a  $^{60}\text{Co}$  source under controlled conditions. b) Scots pine seedlings exposed to different gamma radiation dose rates.

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