Researchers at the British-government-sponsored John Innes Center announced that they had developed a purple tomato that has high levels of beneficial anthocyanins – antioxidants known to neutralize potentially harmful oxygen molecules, or free radicals, in the body and reduce the risk of heart disease and cancer. The genes for the purple tomato came from snapdragons.

Butelli E et al Cathie Martin, Nature Biotechnology 2008
– Enrichment of tomato fruit with health-promoting anthocyanins by expression of select transcription factors.
– Butelli E, et al

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Anthocyanins

• Polyphenols
• High anti-oxidant activities
• NCI recommends one take 5 portions of fruit and vegetable/day. Most do not reach this.
• Tomato is a great candidate for transgenic enhancement of flavonoids.
• Strategy to increase anthocyanin is to express two transcription factors.
• Del and Ros1 genes interact to induce anthocyanin synthesis in snapdragon.

All genes encoding enzymes for anthocyanin synthesis are induced by Del and Ros1
Test if anthocyanin offered health-promoting effect on mice

- Used mouse model
  Trp53 -/- knockout mice.
  Mice spontaneously develop cancers.
  Life span ~ 140 d
- Fed them with tomato powder 10%.
- Control treatment??
- Fed tomato-red or purple

Figure 4 - Life expectancy of Trp53-/- mice fed the standard diet or diets supplemented with 10% red or purple tomato powder

Conclusions

- Anthocyanins might not be directly beneficial.
- Anthocyanins may activate endogenous defense systems to delay oxidative damage.