

## European Association of Urology – Press Release

### **Scientists identify compounds in coffee which may inhibit prostate cancer**

*Type of study: Peer-reviewed/experimental study/animals*

*Published on: Mar 18, 2019*

For the first time, scientists have identified compounds found in coffee which may inhibit the growth of prostate cancer. This is a pilot study, carried out on drug-resistant cancer cells in cell culture and in a mouse model; it has not yet been tested in humans. This work is presented at the European Association of Urology congress in Barcelona, after publication in the peer-reviewed journal *The Prostate*\*.

Coffee is a complex mixture of compounds which has been shown to influence human health in both positive and negative ways. There is increasing evidence that drinking certain types of coffee is associated with a reduction in incidence of some cancers, including prostate cancers\*\*. Now Japanese scientists have studied the effects of two compounds found in coffee, kahweol acetate, and cafestol, on prostate cancer cells and in animals, where they were able to inhibit growth in cells which are resistant to common anti-cancer drugs such as Cabazitaxel.

The researchers initially tested six compounds, naturally found in coffee, on the proliferation of human prostate cancer cells in vitro (i.e. in a petri-dish). They found that cells treated with kahweol acetate and cafestol grew more slowly than controls. They then tested these compounds on prostate cancer cells which had been transplanted to mice (16 mice). 4 mice were controls, 4 were treated with kahweol acetate, 4 with cafestol, with the remaining mice being treated with a combination of kahweol acetate and cafestol.

Study leader, Dr Hiroaki Iwamoto (Department of Integrative Cancer Therapy and Urology, Kanazawa University Graduate School of Medical Science, Japan, first author of the study) said:

*“We found that kahweol acetate and cafestol inhibited the growth of the cancer cells in mice, but the combination seemed to work synergistically, leading to a significantly slower tumour growth than in untreated mice. After 11 days, the untreated tumours had grown by around 3 and a half times the original volume (342%), whereas the tumours in the mice treated with both compounds had grown by around just over one and a half (167%) times the original size.*

*It is important to keep these findings in perspective. This is a pilot study, so this work shows that the use of these compounds is scientifically feasible, but needs further investigation; it does not mean that the findings can yet be applied to humans. We also found the growth reduction in transplanted tumour cells, rather than in native tumour cells. What it does show is that these compounds appear to have an effect on drug resistant cells prostate cancer cells in the right circumstances and that they too need further investigation. We are currently considering how we might test these findings in a larger sample, and then in humans.”*

Kahweol acetate and cafestol are hydrocarbons, naturally found in Arabica coffee. The coffee-making process has been found to affect whether these compounds remain in coffee after brewing (as with espresso), or whether they are stripped out (as when filtered).

Professor Atsushi Mizokami (Department of Integrative Cancer Therapy and Urology, Kanazawa University Graduate School of Medical Science, Japan) added:

*“These are promising findings, but they should not make people change their coffee consumption. Coffee can have both positive and negative effects (for example it can increase hypertension), so we need to find out more about the mechanisms behind these findings before we can think about clinical applications. However, if we can confirm these results, we may have candidates to treat drug-resistant prostate cancer.”*

In an independent comment, Professor Zoran Culig (Professor of Experimental Urology, Medical University of Innsbruck) said:

*“These are interesting findings. I would expect that those initial results will motivate researchers to use more recently developed models, such as patient-derived xenografts which express the androgen receptor. Such experiments will likely provide a definitive answer as to future perspective of this kind of treatment.”*

\*See: Coffee diterpenes kahweol acetate and cafestol synergistically inhibit the proliferation and migration of prostate cancer cells, Iwamoto et al, *The Prostate*. 2018; 1–12.

\*\*See: Reduction by coffee consumption of prostate cancer risk: Evidence from the Moli-sani cohort and cellular models, George Pounis et al (*International Journal of Cancer*, 2017), <https://onlinelibrary.wiley.com/doi/pdf/10.1002/ijc.30720>

This work was funded by JSPS KAKENHI, Grant numbers: 16K10998, 17K11126.