Comment on 'Cytotoxic effect of disulfiram/copper on human glioblastoma cell lines and ALDH-positive cancer-stem-like cells'

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Sir,

I have read the article on anticancer activity of an old anti-alcoholism drug disulfiram published in this Journal (Liu *et al*, 2012) with great interest. In this Letter to the Editor, I would like to stress that we already have clinical evidence for disulfiram anticancer activity. One molecule of disulfiram is cleaved, even as early as in the stomach, to two molecules of ditiocarb, which forms the copper complex in the body (Johansson, 1992). About 20 years ago, Dufour *et al* (1993) published encouraging results of phase II placebo-controlled clinical trial of ditiocarb (diethyl-dithiocarbamate) in 64 women with high-risk breast cancer. After 6 years, overall survival was 81% in ditiocarb group vs 55% in placebo group. The authors used (for 70 kg woman) 700 mg of sodium ditiocarb (~600 mg of ditiocarb itself) dosing *per week*. However, the trial has been forgotten and the authors did not realise that ditiocarb is a main metabolite of disulfiram. The standard dosing of disulfiram today is 250–500 mg *per day* and was even as high as 3000 mg per day (Suh *et al*, 2006). Arguably, breast cancer patients on higher doses of disulfiram may experience much more remarkable benefit than it was shown in Dufour *et al* (1993) trial. In public interest, we urgently need new phase III clinical trials of disulfiram in breast cancer patients to repurpose the cheap (1-year long therapy costs approximately US\$550) and safe drug for breast cancer (Cvek, 2012). Moreover, we already have evidence from a case report that disulfiram is able to cure patient with bone (spine, ribs, pelvis) metastases from breast cancer (Lewison, 1977).

According to the article by Liu *et al* (2012) and after successful trials for breast cancer, disulfiram might be used for the treatment of brain tumours and even other cancers (Cvek, 2011).

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