Sarah Hale et al., J Cancer Sci Ther 2017, 9:7 (Suppl)
DOI: 10.4172/1948-5956-C1-109

A DM1 gold nanoparticle (MTC-100038) is more effective than sorafenib in multiple murine models of hepatocellular carcinoma

Sarah Hale, Kelly Conlon, John Porter, Cristina Espinosa Garcia, Usoa Peral, Alessandro Pace, Ketan Patel, Meike Roskamp, Phil Williams, Angela Robinson, Richard Perrins and **Tom Coulter**
Midatech Pharma, UK

Cytotoxic chemotherapy is the standard of care for many types of cancer despite frequently observed severe side effects. The primary goal of a new cancer treatment is to enhance therapeutic efficacy and minimise harmful side effects. Gold nanoparticles (GNP's) are promising candidates for drug delivery systems for cancer therapeutics due to both the intrinsic non-toxic properties of the gold nanocore and the ability to tailor the functionality of the surface. The highly potent microtubule inhibitor maytansine, is a potent anti-cancer agent, however clinical development was halted due to toxicity. DM1 is a derivative of maytansine. Here we describe how tumour targeting of DM1 using ultra small GNP's (MTC-100038) results in improved efficacy and tolerability compared to DM1 alone in pre-clinical HCC cancer models. In subcutaneous and orthotopic xenograft mouse models (BALB/c nude, NOD/SCID) using human hepatoma cell lines (BEL7404, Hep3B), MTC-100038 increased both the tolerability of DM1 and demonstrated potent anti-tumour activity compared to controls. When comparing reduction in tumour growth, the highest tolerated dose of DM1 alone (150 μg/kg) was not significantly different to vehicle control. Peak reduction in tumour growth with MTC-100038 (337.5 μg/kg) was greater than six-fold (mean reduction more than three-fold) compared to the highest tolerated dose of the current standard of care (SOC) sorafenib (60 mg/kg) in the same studies. In summary, MTC-100038 delivered significant efficacy in mouse models of HCC when compared to the maximum tolerated doses of both DM1 alone, and the current HCC SOC, sorafenib. MTC-100038 will now enter IND enabling studies.

Biography

Kelly Conlon is currently working in Midatech Pharma, UK.

kelly.conlon@midatechpharma.com

Notes: