of IGF-GR was able to reduce proliferation in response to Pro-I in MCF-7 cells but not in MDA-MB157 cells.
In conclusion, in spite of being a selective IR-A ligand with scarce affinity to the typical IGF-GR, Pro-I stimulates proliferation and migration in MCF-7 breast cancer cells through atypical IGF-GR, which have high binding affinity for both insulin and Pro-I.

P01-34
Low-intensity pulsed ultrasounds produces and increase of IGF-I gene expression during fibula bone repair in rats

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Pulsed ultrasounds(PUS) is a form of non-invasive mechanical energy that can be transmitted through the skin as a sound wave of high pressure. This type of mechanical energy has been employed with therapeutic purposes to improve the bone healing. The aim of this study was to measure the temporal expression of IGF-I gene during the process of bone healing in both control and low-intensity pulsed ultrasound (LIPUS) treated fibula fracture in rats. A non-critical size bone fragment was surgically removed from both fibulas. After 24 hours of surgery, the treated animals received 0.5 W/cm^2, 3 min/day LIPUS. On days 2, 5, 10, 15, 20 and 28 postinjury 6 rats per group were sacrificed and bone callus were isolated and processed to obtain total RNA.
For the purpose of this study, we examined the expression of IGF-I involved in bone repair and remodelling. Quantitative real-time polymerase chain reaction (RT-qPCR) showed an upregulation of IGF-I gene at days 5 and 15 and then declined gradually until day 28 postsurgery. Our results indicate that ultrasounds therapy may improve bone repair by increasing IGF-I; a powerful stimulator of osteogenesis, since IGF-I induces cell proliferation, osteoblast differentiation, type I collagen biosynthesis, osteoclastogenesis, and interaction osteoblast-osteoclast.

P01-35
Identification of BRCA1 as a biomarker for IGF-GR targeted therapy in breast cancer

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The insulin-like growth factors, IGF-I and IGF-II, are a family of mitogenic polypeptides with important roles in growth and differentiation. The biological actions of the IGFs are mediated by the IGF-I receptor (IGF-GR). The IGF-GR plays a key role in tumor initiation and progression and it emerged in recent years as a promising therapeutic target in a number of malignancies. BRCA1 is a tumor suppressor gene which participates in multiple biological pathways. Our lab has previously shown that BRCA1 expression in breast cancer cells resulted in reductions in endogenous IGF-GR levels and IGF-GR promoter activity, suggesting that the IGF-GR gene is a downstream target for BRCA1 action. The main aim of this study is to evaluate the hypothesis that the efficacy of IGF-GR-directed therapies in breast cancer is heavily dependent on the BRCA1 status of the patient. We postulate that the mutational and activation status of BRCA1 in breast tumors should predict responsiveness to IGF-GR inhibitors and, in particular, MK-0646, a selective IGF-GR monoclonal antibody. To evaluate our hypothesis, the BRCA1-null HCC1937 breast cancer cell line was transiently transfected with a wild-type BRCA1-encoding expression vector. In addition, MCF10A and MCF7 cell lines were infected using the lentivirus vector pGIPZ encoding a BRCA1 shRNA. The cells were treated with MK-0646 antibody, after which cell proliferation, apoptosis, cell cycle progression and *in vitro* invasion and migration assays were performed. Results of preliminary studies seem to corroborate our hypothesis suggesting that MK-0646 treatment might be more effective in mutant BRCA1- than in wild-type BRCA1-expressing breast cancers due to a higher basal IGF-GR level. These studies will be complemented by cell signaling analyses, micro-array assays and *in vivo* experiments. Taken together, these experiments will provide, for the first time, a correlation between BRCA1 status and the capacity of MK-0646 to target the IGF-GR in breast cancer.

P1b. GH clinical

P01-36
The use of growth hormone and other performance enhancing drugs by university students

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Background: Athletes misuse a variety of drugs to enhance their sporting performance. A previous study reported that 5% of American high school boys have taken human Growth Hormone (GH).
Aims: The aim of the current study was to determine the prevalence of the use of GH and other performance-enhancing drugs among University of Southampton students.
Methods: The use of GH and other performance-enhancing drugs was determined by an anonymous on-line questionnaire, which was e-mailed to approximately 9,000 students. Descriptive statistics were used to analyse the reported prevalence of performance-enhancing drug use. Differences between genders were compared by the Chi-squared test.
Results: 2,229 students completed the online questionnaire. Of those who reported their gender, 35.7% were male. The mean age was 21.3±3.8 years, range 17–60 years. 70% of students were actively involved in sport or exercise. 12 students were competing at national or international level and a further 112 were competing at county or national development level. 6 male students (0.2%), including 1 elite athlete, admitted to taking GH; 1 student took this for medical reasons and 1 took "oral GH" only. 296 students (13.3%) reported knowing someone else who took GH. Men were more likely to know someone taking GH than women (18.6% v 12.5%, $P < 0.0001$). Participation in sport or the level of competition did not alter the likelihood of knowing someone who had taken GH. 23 men (3.4%) and 49 women (5.0%) had considered taking GH to enhance their sporting performance.
In comparison, 170 students reported taking vitamins or other supplements. 7 students (2 men, 3 women, 2 unknown) reported taking androgenic anabolic steroids (AAS). 2 students (1 woman, 1 unknown) reported taking erythropoietin. 333 students (14.9%) and 26 students (1.2%) reported knowing someone else who took AAS or erythropoietin respectively. Unlike GH, there was no difference between men and women in this knowledge.
Students who knew someone taking AAS were more likely to know someone taking erythropoietin than students who did not know someone taking AAS ($P = 0.003$); however, they were not more likely to know someone taking GH ($P = 0.177$).
Conclusion: The self-reported prevalence of GH misuse is much lower than previously reported. Based on knowledge of others' use, however, it would appear that the use of GH remains a significant problem, which is comparable to the use of AAS. Men are more likely than women to know people who take GH but not other performance enhancing drugs.