age population fall each year which can result into fear and loss of independence. An automatic fall detection system is required to prevent serious injury though quick medical response. The purpose of this paper is to differentiate between falls and activities of daily living (ADL) based on smart phone data (three-axis accelerometer and gyroscope) by applying different classification methods (neural network, state vector machine (SVM), and decision trees). To implement this data from the smartphone; where a database was constructed based on the features which was extracted and the classification algorithms are implemented in Matlab. The classification methods are compared against each other through performance indicators. The results obtained show that SVM has a high accuracy compared to the other classification methods.

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Bone tissue engineering and 3-D printing and reconstruction of skeletal damage for animals and humans

Leonardo Leonardi [1,*], Federica Piro [1], Enrico Bellezza [1], Roberto Marsili [2], Luca Mechelli [1], Valentina Pannaioli [3], Gianluca Rossi [2]

[1] *Department of Veterinary Medicine, University of Perugia, Perugia, Italy*
[2] *Department of Engineering, University of Perugia, Perugia, Italy*
[3] *Dimension 4, Città di Castello, Perugia, Italy*

E-mail address: leonardo.leonardi@unipg.it (L. Leonardi).

The technology of 3-D printing was described first in 1986 and from this time developed and actually represent one of the most important way to produce viable tissues and bioscaffolds. In veterinary and human medicine is being used frequently during reconstructive and surgical procedures. We applied these technologies in collaboration with the colleagues from Department of Engineering in Perugia to produce mainly prostheses and plaques of different sizes and materials to repair fractures and for reconstruction of skeletal damages.

In this specific basic protocol we used a bone fracture in a six-month male, German sheperd dog admitted to the Veterinary teaching hospital, with an history of lumbosacral pain and hind limb lameness. In our studies we made a tridimensional prosthetic model for a pelvic bones suggesting a lot of potential future applications of these techniques in veterinary medicine. Stress distribution on the prosthesis has been measured by the thermoelasticity non-contact measurement technique, in order to avoid dangerous stress concentration. These techniques permit the use of several materials depending of the kind of lesions and its localization.

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A meta-analysis based on associations between milk protein polymorphism and production traits

Memis Ozdemir*, Sinan Kopuzlu, Mehmet Topal, Omer Cevdet Bilgin

Animal Science, Department of Animal Science, Biometry, and Genetics, Ataturk University, 25240 Erzurum, Turkey

E-mail address: ozdemirm@atauni.edu.tr (M. Ozdemir).

Many researchers who have studied the relationships between milk protein polymorphisms and some yield traits of livestock have reported incompatible results. In this study, in order to examine the overall relationships between milk protein genes known as major genes (CSN1S1, CSN2, CSN3, and BLG) and some yield traits (daily milk yield, lactation milk yield, fat yield, fat content, protein yield, and protein content), a meta-analysis was performed using some genetic models reported in the results of previous studies on cattle. As a result, the meta-analysis demonstrated that the relationships of major milk protein genes with other factors should be examined using the co-dominant genetic model in general. Relationships between some CSN3 genotypes and fat yield, fat content, and protein content, and relationships between some BLG genotypes and daily milk yield, fat content, protein yield, and protein content were found statistically significant ($p < 0.05$). No significant relationships were found between these genotypes and other yield traits. In addition, no significant relationships between the CSN1S1 and CSN2 genotypes and the yield traits examined were observed.

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Optimization of gynogenesis induction in leek (*Allium ampeloprasum* var. *porrum*)

Fevziye Celebi Toprak*, Ali Ramazan Alan

Pamukkale University Plant Genetics and Agricultural Biotechnology Application and Research Center (PAU BIYOM), Kinikli, Denizli, Turkey

E-mail address: fctoprak@pau.edu.tr (F.C. Toprak).

A detailed study was carried out to investigate the roles of auxin and cytokinin type plant growth regulators (PGRs) and sucrose in leek gynogenesis induction. Flower buds collected from two open pollinated (OP) leek genotypes were cultured in a BDS-based media with or without plant PGRs and sucrose. In the media containing sucrose (25, 50, 75, or 100 g/l) gynogenic leek embryos started emerging about three months after culture initiation. However, flower buds cultured in sucrose-free media failed to develop and no gynogenic plantlets developed in this medium. Addition of PGRs did not improve gynogenesis response in sucrose-free media. It was found that gynogenesis can be induced in the presence of sucrose (25 g/l and above) regardless of presence or absence of PGRs. The highest frequency (~5%) of gynogenic plantlet production was obtained from TU (an OP selection line) in a PGR-free medium containing 100 g/l sucrose. Flower buds of the same genotype showed substantially lower response (0.7%) in the medium containing both PGRs and 100 g/l sucrose. These results suggest that addition of 100 g/l sucrose into the induction medium (BDS) is necessary for a successful gynogenesis induction in leek.

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