and 29 weeks follow-up. Accelerated weight-bearing and rehabilitation (8 versus 11 weeks) was demonstrated to be safe and effective at five years following matrix autologous chondrocyte implantation for cartilage defects in the knee.
Conclusions: The literature search will be updated inclusive through March 2013 and results presented.

I-26
YEAR IN REVIEW: BIOLOGY OF OA

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The purpose of this review is to present highlights from the published literature on the topic of the biology of OA.
A PubMed search was conducted in order to locate original research manuscripts published since the last OARSI meeting in 2012. The search terms osteoarthritis and/or cartilage produced over 3000 references which were further searched for references containing both terms as well as for terms covering other joint tissues affected by OA (meniscus, synovium, ligaments and bone). From these common themes emerged as active areas of research over the past year including studies in the areas of epigenetics (in particular miRNA studies) and transcriptomics. There appeared to be an increase from previous years in the number of studies focused on tissues other than articular cartilage such as subchondral bone, synovium and meniscus. Selected studies chosen from the most recent publications of high relevance to OA biology will be discussed.

I-27
OSTEOARTHRITIS YEAR 2013 IN REVIEW: GENETICS AND GENOMICS

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Progress in the different areas of genetic research has produced important highlights in the last year. One of wide impact is the publication of the ENCODE project. This project has analyzed transcription and its regulation, including epigenetic marks and transcription factors, in multiple cell lines across the genome. The results have shown the impressive complexity of the works of the human genome and have provided us with a wealth of data that will accelerate research in all aspects of genetics. More specific of OA has been the discovery of new *loci* associated with OA: a dozen *loci* with genome wide significant association in Europeans or Asians are already known, with others showing promising results. New additions include the five *loci* identified in the arcOGEN GWAS and other loci resulting from metaanalysis of multiple GWAS and additional sample collections. These discoveries have shown the value of large sample sizes for association studies and of the investigation of OA endophenotypes. They have also provided solid information on a much discussed issue, the relative difficulty of finding *loci* in OA and its relationship with OA phenotype heterogeneity or with misclassification of controls. The arcOGEN list of discoveries includes two good candidate genes: *CHST11* coding for the enzyme attaching sulfate to the N-acetylgalactosamines of chondroitin sulfate 4, and *PTHLH*, which is an established regulator of chondrocyte differentiation and skeletogenesis. Functional studies of OA loci continue defining their involvement in OA by exploring their expression and downstream effects in joint tissues. Previous studies have analyzed the six genes contained in the *7q22* locus and reached different conclusions about which of them is the most likely candidate. This year, a new report supports *HBP1* over the other five genes based on differential allele expression in joint tissues. MicroRNA studies have continued to expand the list of joint changes and OA phenotypes that are controlled by this wide family of post-transcriptional regulators. The variety of results makes them difficult to summarize, but they show the ubiquitous participation of microRNAs in all aspects of OA. A different type of small non-coding RNA, the small nucleolar RNAs U38 and U48, have made their surprising debut in OA as serum biomarkers of cartilage damage. Analysis of DNA methylation in the promoters of *NOS2* (iNOS) and *SOX9* has provided more evidence of the importance of this epigenetic modification in OA. These studies add new layers of complexity to our knowledge of OA biology. Gene expression microarray studies have addressed differences between hip and knee OA, between growth plate and articular cartilage, and between Kashin-Beck disease and OA. All these last year results together with ongoing collaborative projects and technical developments predict an accelerated progress in all areas of OA genetics for the coming months.

I-28
OSTEOARTHRITIS YEAR 2013 IN REVIEW: BIOMARKERS; ARE WE MAKING STEPS AHEAD?

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In 2010, in *Osteoarthritis and Cartilage* (van Spil WE *et al.*), we published a comprehensive systematic review applying the consensus BIPED criteria on serum and urinary biochemical markers for knee and hip osteoarthritis (OA) that were available at that time. It was concluded that none of the biochemical markers at that time was sufficiently discriminating to aid to diagnosis and prognosis of OA in individuals or limited numbers of patients, or performed so consistently that it could function as an outcome in clinical trials. It was suggested that more research on molecular validation and the origins and metabolism of biochemical markers would be necessary. Also, wide-spectrum biochemical marker analysis in well-defined populations, preferably with protocolised sample collection, was considered valuable. Together this would clarify many unknowns about biochemical markers that hampers progression of the field.
At present, more than 2 years later, in this 'year in review' on biomarkers of OA we will discuss the progress that has been made in the field ever since. And, in all modesty, we will try to recommend on how the field may reach the ultimate goal of having proper biochemical markers that can serve as diagnostic, prognostic, and/or monitoring tools.

I-29
OSTEOARTHRITIS YEAR IN REVIEW: IMAGING

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Purpose: To review recent original research publications related to imaging of osteoarthritis and identify emerging trends and significant advances.
Methods: To identify relevant articles an extensive search was performed of the PubMed database using the query terms "osteoarthritis" in combination with "imaging", "radiography", "MRI", "ultrasound", "computed tomography", "nuclear medicine" for articles published or in press between April 2012 and January 2013. Abstracts were reviewed to exclude review articles, case reports, and studies not focused on imaging using routine clinical imaging measures.
Results: Initial query yielded 932 references which were reduced to 328 citations following the initial review. MRI (118 references) and radiography (129 refs) remain the primary imaging modalities in OA studies, with growth in application of CT (35 refs) and ultrasound (23 refs). MRI parametric mapping techniques remain an active research area (33 refs) with growth in T2*- and T1rho mapping publications. Although the knee is the major joint studied (210 refs) there is growing interest in the hip (106 refs) and hand (29 refs). Imaging continues to focus on evaluation of cartilage (173 refs) and bone (119 refs).
Conclusions: Imaging plays a major role in osteoarthritis research with continued growth along traditional lines of investigation. Emerging trends are application of advanced MRI techniques in the study of the hip and growth in quantitative methods for evaluating changes in bone.