midnight cortisol, urinary free cortisol or ACTH levels). However, there was a strong inverse correlation between the difference of TL in active disease compared to controls and triglyceride level for all lymphocyte subtypes (range r= -0.74 to -0.86, range *p*= .003 to *p*=.022), suggesting that the higher the triglyceride levels, the shorter the TL in patients with CS. Additionally, inverse correlation was observed for weight and BMI SDS and B-cell TL, specifically (r= -0.76, *p*= .019 and r= -0.76, *p*= .018, respectively). Furthermore, there appeared to be an implication for shorter TL in CS patients with dyslipidemia compared to those without (mean TL difference from controls: -1.1 Kb in patients with dyslipidemia vs 0.53 Kb in those without, *p*= .067).
We conclude that although TL in active CS does not seem to differ from controls, B-cell and NK-cell TLs are affected after cure, and this may be related to acute changes that occur in the immune system peri- and post-operatively. Interestingly, the level of TL shortening correlates strongly with several complications of CS, including weight, BMI and dyslipidemia. This suggests that TL may be used as a surrogate prognostic marker of hypercortisolemia-related complications.

# Bone and Mineral Metabolism

## OSTEOPOROSIS: DIAGNOSIS AND CLINICAL ASPECTS

### *Deterioration of Bone Microarchitecture in Prediabetes Is Partly Mediated Through Fibroblast Growth Factor 21*

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**SUN-372**

**Introduction:** Prediabetes has been reported to be associated with a worse trabecular bone score (TBS). Fibroblast growth factor 21 (FGF21) levels are raised in prediabetes and other insulin-resistant states, and FGF21 has been reported to be implicated in bone metabolism. We compared the bone mineral density (BMD) and TBS between prediabetes and normoglycemia, and studied the correlation of FGF21 with BMD and TBS. **Method:** Chinese postmenopausal women aged between 55 and 80 and without type 2 diabetes were recruited from the Hong Kong Cardiovascular Risk Factor Prevalence Study between November 2016 and October 2018. Participants were excluded if they were already on anti-osteoporosis therapy, had secondary causes of osteoporosis, had body mass index (BMI) <15 or >37 kg/m$^2$ (when TBS measurement may not be accurate), or had an estimated glomerular filtration rate (eGFR) <30mL/min. They were divided into prediabetes (defined by fasting glucose ≥5.6mmol/L or HbA1c ≥5.7%) and normoglycemia. BMD and TBS were measured by dual-energy X-ray absorptiometry. Serum FGF21 levels were measured with an in-house ELISA kit. **Results:** 258 participants were included (130 prediabetes and 128 normoglycemia), with a mean age of 61.5±5.1years and mean BMI of 24.2±3.7kg/m$^2$. BMD over lumbar spine, femoral neck and total hip were all comparable between prediabetes and normoglycaemia, while TBS was lower in prediabetes (1.27±0.07 vs 1.30±0.07, p=0.007), which remained significant after adjustment for age and BMI. Serum FGF21 levels did not correlate with BMD but inversely correlated with TBS. On multiple linear regression models, serum FGF21 levels showed an independent inverse correlation with TBS (standardized beta -0.13, p=0.031), which remained significant with the inclusion of homeostasis model assessment of insulin resistance (HOMA-IR) in the model. **Conclusion:** Among Chinese postmenopausal women, bone quality was worse in prediabetes despite comparable bone density. Serum FGF21 levels showed a significant independent correlation with TBS, suggesting the potential impact of FGF21 on the deterioration of the bone microarchitecture in prediabetes.

# Tumor Biology

## TUMOR BIOLOGY: DIAGNOSTICS, THERAPIES, ENDOCRINE NEOPLASIAS, AND HORMONE DEPENDENT TUMORS

### *Regional Hyperthermia Enhances Selective Mesenchymal Stem Cell Migration Towards the Tumor Stroma*

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**SUN-120**

The tumor homing characteristics of mesenchymal stem cells (MSCs) make them attractive vehicles for the tumor-specific delivery of therapeutic agents, such as the sodium iodide symporter (NIS). NIS is a theranostic protein that allows non-invasive monitoring of the *in vivo* biodistribution of functional NIS expression by radioiodine imaging as well as the therapeutic application of $^{131}$I. To enhance the actively recruitment of MSCs to growing tumor stroma and thereby trigger targeted delivery of the NIS gene to the tumor, we examined the combination with regional hyperthermia, as heat induces the secretion of immunomodulatory chemokines, cytokines and growth factors, well-known attractants of MSCs.
Human hepatocellular carcinoma cells (HuH7) were heat-treated in a water bath at 41 °C for 1h, followed by incubation at 37 °C for 0-48h. mRNA and protein levels of chemokines involved in MSC migration was analyzed by RT-PCR and ELISA. Chemotaxis of MSCs in relation to a gradient of supernatants was tested in a 3D live cell tracking migration assay. In a subcutaneous HuH7 mouse xenograft tumor model, a single systemic injection of CMV-NIS-MSCs was applied 6h, 24h, 48h after or 24h, 48h before hyperthermia treatment and tumoral $^{123}$I accumulation was assessed by $^{123}$I-scintigraphy. *Ex vivo* NIS analysis of tumor sections was performed by RT-PCR and