

## **P012** Hyaluronan turnover in synovial joints

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Hyaluronan (HA), a key component of synovial fluid, escapes slowly across synovium, to be replaced by fibroblast-like synovocytes. The aims were to measure HA secretion, HA loss and endogenous HA mass to evaluate HA turnover time *in vivo*. HA mass ( $m_{endog}$ ) was harvested from anaesthetized rabbit knees by washout. Secretion rate  $\dot{q}_{HA}$  was measured by washouts 5h later. To assess loss, HA mass  $I$  was injected and mass  $R$  recovered after 5h. HA was analysed by HPLC. Secretion corrected for loss is  $\dot{q}_{HA}^{corrected} = \dot{q}_{HA} / (R - 5 \dot{q}_{HA})$  and true loss  $L = (I + 5 \dot{q}_{HA}^{corrected}) - R$ . HA turnover time was  $m_{endog} / \dot{q}_{HA}^{corrected}$ .

Apparent  $\dot{q}_{HA}$  was  $16.2 \pm 1.3 \mu\text{g h}^{-1}$  in 34 static joints and  $30.9 \pm 2.6 \mu\text{g h}^{-1}$  in 25 moved joints. Apparent HA loss ( $I - R$ ) was  $46.4 \pm 6.0\%$  in 5 static and  $39.5 \pm 4.6\%$  in 5 moved joints. HA secretion rates corrected for loss were  $30.5 \pm 2.8 \mu\text{g h}^{-1}$  and  $61.9 \pm 5.6 \mu\text{g h}^{-1}$  in static and moved joints.  $m_{endog}$  was  $468 \pm 24 \mu\text{g}$ . Turnover time was  $17.1 \pm 1.4$  h in static and  $8.4 \pm 0.6$  h in moved joints.

Joint movement stimulated HA secretion. HA loss was significant. Turnover time was much longer than for albumin or water (1-2h). This is because synovium is an ultrafilter for HA. The estimates of HA loss and hence  $\dot{q}_{HA}^{corrected}$  may be overestimates for normal joints because the injected fluid increased outflow, which increases trans-synovial HA flux.