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Comparison of the progression of glomerulosclerosis between Oim-C57BL/6 and Oim-B6C3Fe a/a

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Osteogenesis Imperfecta (OI), a heritable connective tissue disorder, resulting from mutations in the type I procollagen genes is characterized by bone deformity and fragility. The OI mouse model (oim) is homozygous for a null mutation in the COL1A2 gene of type I collagen, displaying a bone phenotype mimicking type III OI in humans. These mice also have glomerulosclerosis characterized by $\alpha_1(I)$ homotrimeric type I collagen deposition within their glomeruli. Previous studies in our laboratory demonstrate that oim-B6C3Fe a/a mice exhibit accumulation of glomerular fibrillar collagen beginning post-natally by one week of age, showing increasing severity with continued development. Heterozygous (het) mice have an intermediate glomerular phenotype between homozygous (oim) and wildtype (wt) mice. Although the oim mutation on the C57BL/6 mouse background shows a more severe bone phenotype than its B6C3Fe a/a counterpart, the impact on the glomerular progression and severity is unknown. Preliminary morphometry mapping and lesion scoring data suggest the oim mutation on C57BL/6 and B6C3Fe a/a backgrounds exhibit similar glomerulosclerotic lesion progression between one and four months of age. Het mice of both backgrounds exhibited mild lesions, and little progression of the glomerulopathy beyond one month (0.3075 \pm 0.23 and 0.712 \pm 0.29 for C57BL/6 and B6C3Fe a/a, respectively). Within oim mice, glomerulosclerosis varies in severity as reflected by a large standard deviation. However, both oim-C57BL/6 and oim-B6C3Fe a/a mouse strains exhibit similar patterns of glomerulosclerotic development with age. One month oim-C57BL/6 mice have less affected glomeruli (1.65 \pm 0.55) as compared to oim-B6C3Fe a/a mice (2.1 \pm 1.0) suggesting slower progression of disease in oim-C57BL/6, although they reach the same severity by four months of age (3.04 \pm 0.4 and 3.29 \pm 0.49, respectively). This suggests that regardless of strain, glomerulosclerotic lesions progress similarly, and C57BL/6 mice are appropriate for further studies.