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Immunogenicity and tumorigenicity of pluripotent stem cells

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Immunogenicity and Tumorigenicity of Pluripotent Stem Cells

Nigel G. Kooreman



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Immunogenicity and Tumorigenicity of Pluripotent Stem Cells

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To my parents

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Kooreman N.G., Adam M., Jagger A., Wagenhauser M., Mehrkens D., et al. <i>Arteriosclerosis, Thrombosis and Vascular Biology (ATVB).</i> 2018; 38, 1796-1805.		
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Kooreman N.G., Kim Y., de Almeida P.E., Termglichan V., Diecke S., et al. <i>Cell Stem Cell</i> . 2018; 22, 501-513.e7		

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