



**46<sup>th</sup> LEEDS-LYON SYMPOSIUM on TRIBOLOGY**  
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**Invited talk**

**Lubricious coatings for precision positioning  
of medical needles**

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Many traditional medical procedures are being replaced by needle-based minimal invasive techniques, due to higher survival rates and lower disease burdens. However, to reach the target with a needle can be a difficult task, because the needle needs to be maneuvered around delicate tissue, such as nerves, blood vessels and healthy organs. This procedure is complicated by shear stresses that occur between the needle and tissue as well as the skin, which deform and move the tissue during insertion. To reduce these shear stresses needle-lubricants are necessary. Polymer brushes are well known for their excellent lubricious properties. However, before brushes can be applied on needles, several challenges need to be tackled. In this presentation, I will discuss these challenges and show possible solutions that we have been developing in our research group.