days, these anti-VEGF drugs clear from the eye after standard intravitreal injection, necessitating monthly super-threshold bolus doses in attempt to prolong therapeutically effective periods.

A sustained and controlled release drug delivery device capable of delivering drugs including protein therapeutics to the anterior and/or posterior segments of the eye while minimizing the number of intraocular injections required for treatment and maintaining a therapeutic concentration of drug within the eye is of interest.

SUMMARY

Multilayer thin film medical devices that include a bioactive agent for elution to the surrounding tissue upon administration to a subject are provided. Also provided are methods and kits for localized delivery of a bioactive agent to a tissue of a subject, and methods of preparing the subject devices. The multilayer thin film medical device includes a first layer, a bioactive agent and a second layer. The first and the second layers may be porous or non-porous. The devices have a furled structure, suitable for administration to a subject via needle or a catheter.

In one aspect of the present disclosure, there is provided a multilayer thin film medical device, comprising: a first layer comprising a polymer; a bioactive agent; and a second layer comprising a polymer; wherein the bioactive agent is positioned between the first layer and the second layer, wherein the first and the second layers are in contact with each other at a periphery of the multilayer thin film medical device thereby sealing the bioactive agent inside the multilayer thin film medical device, wherein the bioactive agent is not positioned between the first and the second layers at the periphery of the multilayer thin film medical device, and wherein the multilayer thin film medical device is configured to release the bioactive agent from surface of the first layer and the second layer.

Multilayer thin film devices that include a bioactive agent for elution to the surrounding tissue upon administration to a subject are provided. The devices are useful as medical devices for drug delivery, including ocular devices for delivery of bioactive proteins and small molecules. Also provided are methods of localized delivery of a bioactive agent to a tissue of a subject, and methods of preparing the subject multilayer thin film medical devices.

In certain embodiments, the multilayer thin film medical devices include a first thin film layer, bioactive agent and a second thin film layer, where the bioactive agent is positioned between the first and second layers. The first layer may include a polymer and a pore forming agent. The second layer may be porous or non-porous. The first and second layers may be biodegradable or non-biodegradable. Following administration to a subject, the pore forming agent dissolves to produce a porous first layer and provides for elution of the bioactive agent (e.g., a protein therapeutic) to the surrounding tissue. In some embodiments, the device further includes a third nanostructured porous layer positioned between the first layer and the reservoir of bioactive agent.

In certain embodiments, the multilayer thin film medical devices include a first non-porous thin film layer, a bioactive agent, and a second non-porous thin film layer, where the bioactive agent is positioned in between the first and second layers.