SUMMARY OF THE INVENTION

[0004a] According to an aspect of the present invention, there is provided device configured to inhibit a virus from infecting cells in a target region, the device comprising:
an AC voltage generator configured to apply an AC voltage and impose an alternating electric field in the target region for a duration of time, wherein the alternating electric field has a frequency between 25 kHz and 1 MHz and a field strength, and wherein the AC voltage generator is configured to impose the alternating electric field in the target region for the duration of time to inhibit infection of the cells in the target region by the virus while a therapeutically-effective dose of an antiviral agent is administered to the target region.

[0005] There is disclosed a first method of inhibiting a virus from infecting cells in a target region. The first method comprises the steps of imposing an alternating electric field in the target region for a duration of time, the alternating electric field having a frequency and a field strength, wherein when the alternating electric field is imposed in the target region for the duration of time, the alternating electric field inhibits infection of the cells in the target region by the virus.

[0006] In some instances of the first method, the target region is a region within a live subject, and the alternating electric field is safe for the subject. In some of these instances, the target region is tumor-free.

[0007] Some instances of the first method further comprise the step of delivering an antiviral agent to the target region so that a therapeutically effective dose of the antiviral agent is present in the target region while the imposing is performed.

[0008] In some instances of the first method, the alternating electric field has a frequency between 50 and 500 kHz. In some instances of the first method, the alternating electric field has a frequency of about 200 kHz.

[0009] In some instances of the first method, the alternating electric field has a field strength between 1 and 5 V/cm RMS. In some instances of the first method, the alternating electric field has a field strength of about 1.2 V/cm RMS.

[0010] In some instances of the first method, the duration of time is between 1 and 48 hours. In some instances of the first method, the duration of time is between 2 and 14 days. In some instances of the first method, the duration of time is about 48 hours.

[0011] In some instances of the first method, the alternating electric field has an orientation that is repeatedly switched between at least two directions during the duration of time. In some of these instances, the orientation of the alternating electric field is switched about once a second.

[0012] In some instances of the first method, the alternating electric field has an orientation that is repeatedly switched between a first direction and a second direction during the duration of time, and the first direction is roughly perpendicular to the second direction.

WHAT IS CLAIMED IS:

1. A device configured to inhibit a virus from infecting cells in a target region, the device comprising:
an AC voltage generator configured to apply an AC voltage and impose an alternating electric field in the target region for a duration of time, wherein the alternating electric field has a frequency between 25 kHz and 1 MHz and a field strength, and wherein the AC voltage generator is configured to impose the alternating electric field in the target region for the duration of time to inhibit infection of the cells in the target region by the virus while a therapeutically-effective dose of an antiviral agent is administered to the target region.

2. The device of claim 1, wherein the target region is a region within a live subject.

3. The device of claim 2, wherein the target region is tumor-free.

4. The device of any of claims 1 to 3, wherein the alternating electric field has a frequency between 50 kHz and 500 kHz.

5. The device of any of claims 1 to 3, wherein the alternating electric field has a frequency of about 200 kHz.

6. The device of any of claims 1 to 5, wherein the alternating electric field has a field strength between 1 V/cm RMS and 5 V/cm RMS.

7. The device of any of claims 1 to 5, wherein the alternating electric field has a field strength of about 1.2 V/cm RMS.

8. The device of any of claims 1 to 7, wherein the duration of time is between 1 hour and 48 hours.

9. The device of any of claims 1 to 7, wherein the duration of time is between 2 days and 14 days.

10. The device of any of claims 1 to 7, wherein the duration of time is about 48 hours.

11. The device of any of claims 1 to 10, wherein the alternating electric field has an orientation that is repeatedly switched between at least two directions during the duration of time, optionally the orientation of the alternating electric field is switched about once a second.

12. The device of any of claims 1 to 10, wherein the alternating electric field has an orientation that is repeatedly switched between a first direction and a second direction during the duration of time, and the first direction is roughly perpendicular to the second direction.

13. The device of any of claims 1 to 12, wherein the alternating electric field is applied to the target region via capacitively-coupled electrodes.