CLAIMS

1. An ingestible device comprising:

a control device; and

an energy harvester electrically coupled to the control device, the energy harvester configured to receive energy in one form and convert the energy into a voltage potential; and

a communication element configured to be communicatively coupled to a probe such that information can be communicated between the communication element and the probe.

2. The ingestible device of claim 1, wherein the energy harvester is configured to receive energy from an energizing portion of the probe.

3. The ingestible device of claim 1 or 2, wherein the communication element includes a partial power source electrically coupled to the energy harvester and the control device, the partial power source comprising:

a first electrode electrically coupled to the control device; and

a second electrode electrically coupled to the control device and electrically isolated from the first electrode;

wherein the first and second electrodes are configured to generate a voltage potential when in contact with an electrically conductive liquid.

4. The ingestible device of claim 3, wherein the first and second electrodes are made of dissimilar materials.

5. The ingestible device of any of the preceding claims, wherein the communication element is configured to communicate the information to a detection portion of the probe.

6. The ingestible device of claim 5, wherein the communication element is configured to communicate the information to the detection portion of the probe by sending a signal via a capacitive coupling between the communication element and the probe.

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7. A system comprising:

an ingestible device comprising:

a control device;

an energy harvester coupled to the control device, the energy harvester configured to receive energy and convert the energy into a voltage potential; and

a communication element coupled to the control device; and

a probe comprising:

an energy source configured to energize the control device via the energy harvester; and

a circuit configured to be communicatively coupled to the communication element such that information can be communicated between the communication element and the probe.

8. The system of claim 7, wherein the energy harvester is configured to receive energy from the energy source of the probe.

9. The system of claim 7 or 8, wherein the communication element includes a partial power source electrically coupled to the energy harvester and the control device, the partial power source comprising:

a first electrode electrically coupled to the control device; and

a second electrode electrically coupled to the control device and electrically isolated from the first electrode;

wherein the first and second electrodes are configured to generate a voltage potential when in contact with an electrically conductive liquid.

10. The system of claim 9, wherein the first and second electrodes are made of dissimilar materials.

11. The system of claim 9, wherein the circuit comprises first and second plates configured to be capacitively coupled to the first and second electrodes to communicate the information between the communication element and the probe.

12. The system of claim 11, further comprising a sensing amplifier electrically coupled to the first and second plates.

13. The system of claim 12, further comprising a computer system communicatively coupled to the sensing amplifier.

14. The system of claim 11, wherein the first and second electrodes are configured to communicate the information to the circuit portion of the probe by sending a signal via a capacitive coupling between the first and second electrodes and the first and second plates.

15. A method comprising:

energizing an ingestible device by providing energy from a probe to the ingestible device via an energy harvester; and

sending signals via a capacitive coupling between the ingestible device and the probe in response to the energizing.

16. The method of claim 15, further comprising introducing the ingestible device between first and second plates of the probe.

CLAIMS

1. An ingestible device comprising:

an ingestible identifier;

a control device coupled to the ingestible identifier;

an energy harvester electrically coupled to the control device, the energy harvester configured to receive energy in one form and convert the energy into a voltage potential; and

a communication element configured to be communicatively coupled to a probe such that information can be communicated wirelessly between the communication element and the probe when the control device is energized by the voltage potential, and wherein the communication element is configured to be communicatively coupled to a receiver such that information can be communicated conductively between the communication element and the receiver by electrical current conduction in an electrically conductive fluid when the ingestible identifier is placed in the electrically conductive fluid.

2. The ingestible device of claim 1, wherein the energy harvester is configured to receive energy from an energizing portion of the probe.

3. The ingestible device of claim 1, wherein the communication element includes a partial power source electrically coupled to the energy harvester and the control device, the partial power source comprising:

a first electrode electrically coupled to the control device; and

a second electrode electrically coupled to the control device and electrically isolated from the first electrode;

wherein the first and second electrodes are configured to generate another voltage potential when in contact with an electrically conductive liquid.

4. The ingestible device of claim 1, wherein the communication element is configured to communicate the information to a detection portion of the probe.

5. The ingestible device of claim 4, wherein the communication element is configured to communicate the information to the detection portion of the probe by sending a signal via a capacitive coupling between the communication element and the probe.

6. The ingestible device of claim 3, wherein the first and second electrodes are made of dissimilar materials.

7. A system comprising:

(1) an ingestible device comprising:

an ingestible identifier;

a control device coupled to the ingestible identifier;

an energy harvester coupled to the control device, the energy harvester configured to receive energy and convert the energy into a voltage potential; and

a communication element configured to be communicatively coupled to a probe such that information can be communicated wirelessly between the communication element and the probe when the control device is energized by the voltage potential, and wherein the communication element is configured to be communicatively coupled to a receiver such that information can be communicated conductively between the communication element and the receiver by electrical current conduction in an electrically conductive fluid when the ingestible identifier is placed in the electrically conductive fluid; and

(2) a probe comprising:

an energy source configured to energize the control device via the energy harvester; and

a circuit configured to be communicatively coupled to the communication element such that information can be communicated between the communication element of the ingestible device and the probe.

8. The system of claim 7, wherein the energy harvester is configured to receive energy from the energy source of the probe.

9. The system of claim 7, wherein the communication element includes a partial power source electrically coupled to the energy harvester and the control device, the partial power source comprising:

a first electrode electrically coupled to the control device; and

a second electrode electrically coupled to the control device and electrically isolated from the first electrode;

wherein the first and second electrodes are configured to generate another voltage potential when in contact with an electrically conductive liquid.

10. The system of claim 9, wherein the first and second electrodes are made of dissimilar materials.

11. The system of claim 9, wherein the circuit comprises first and second plates configured to be capacitively coupled to the first and second electrodes to communicate the information between the communication element and the probe.

12. The system of claim 10, further comprising a sensing amplifier electrically coupled to the first and second plates.

13. The system of claim 11, further comprising a computer system communicatively coupled to the sensing amplifier.

14. The system of claim 10, wherein the first and second electrodes are configured to communicate the information to the circuit portion of the probe by sending a signal via a capacitive coupling between the first and second electrodes and the first and second plates.

15. A method comprising:

energizing an ingestible device by providing energy from a wireless energy source to the ingestible device via an energy harvester; and

sending signals via a capacitive coupling between the ingestible device and a probe comprising first and second plates in response to the energizing.

16. The method of claim 15, further comprising introducing the ingestible device between the first and second plates of the probe.