CLAIMS

1. A bioprocessing system, comprising:

a series of processing stations for performing operations for bioprocessing;

an automated system, comprising:

~~means for manipulating~~a tube welder configured to manipulate a fluid connection between a first tube connected to a first container and a second tube connected to a separable second container whereby to create an aseptic connection that enables a controlled transfer of fluid or cell material between the first container and the second container,

wherein the ~~means for manipulating a fluid connection~~ tube welder is configured to create an aseptic connection that can be disconnected after the transfer of fluid or cell material is complete to enable a further such fluid connection to be manipulated between the first container and a separable third container;

means for installing the containers into each of the series of processing stations and moving the containers between stations; and

means for controlling an automated sequence of operation of the processing stations; and

wherein the tube welder is configured as an end effector for a robotic arm.

2. The processing system of claim 1, wherein the ~~means for manipulating a fluid connection~~tube welder is further configured to seal a disconnected fluid connection, such that the transfer of fluid or cells to or from the first and second containers is inhibited.

3. The processing system of claim 1 or 2, further comprising means for enabling the transfer of fluid or cells between aseptically connected containers.

4. The processing system of any of claims 1 to 3, wherein the system is located within a non-sterile atmosphere.

5. The processing system of any preceding claim, further comprising means for inspecting the fluid connection.

6. The processing system of claim 5, wherein the fluid connection is inspected automatically.

7. The processing system of claim 5 or 6, further comprising a camera with a microscope lens to inspect the aseptic connection between the tubes and/or to identify each of the containers.

8. The processing system of any of claims 5 to 7, further comprising one or more sensors configured to detect fluid leakage from the aseptic connection, for example when fluid is pumped through the tubes once joined.

9. The processing system of claim 8, wherein the one or more sensors comprise at least one of: a fluid sensor and a pressure sensor.

10. The processing system of any of claims 5 to 9, wherein the ~~means for manipulating a fluid connection~~tube welder is further configured to apply to the joined tubes a force on either side of the aseptic connection such that a mechanical property can be determined.

11. The processing system of any preceding claim, wherein the automated sequence of operation(s) is controlled according to a predetermined workflow(s), preferably a reconfigurable bioprocessing workflow(s).

12. The processing system of any preceding claim, wherein the series of processing stations includes means to perform concentrations, washing and incubation.

13. The processing system of any of the preceding claims, wherein the system is configured to process multiple containers at the same time, preferably wherein two or more of the containers contain patient samples.

14. The processing system of claim 13, wherein a first container containing a first patient sample is processed using a different predetermined workflow to a second container containing a second patient sample.

15. An automated system for fluidly connecting two containers, wherein at least the first container has a tube fluidly connected at a first end thereto, with a second end of the tube configured to form an aseptic connection with another such tube, the automated system comprising:

a robotic device configured to engage the second end of the tube that is fluidly connected to the first container, and to position the tube into one or more positions to be manipulated;

means for manipulating a portion of the tube towards the second end of the tube whereby to configure the second end of the tube for creating an aseptic connection with another such tube,

wherein the means for manipulating a portion of the tube further comprises:

means for clamping a portion of the tube towards the second end of the tube whereby to form a pinched portion in the tube such that the tube is fluidly sealed upstream of the pinched portion; and

means for removing a section of the tube downstream of the pinched portion whereby to remove the second end of the tube such that a new second end of the tube is thereby formed that has not previously contacted another such tube; and

wherein the means for clamping a portion of the tube and the means for removing a section of the tube are configured as an end effector for a robotic arm.

16. The automated system of claim 15, further comprising means for enabling a controlled transfer of fluid and cell material between the first container and the second container.

17. The automated system of claim 16, wherein the means for enabling a controlled transfer of fluid and cell material is further configured to draw fluid away

from the pinched portion in the tube before the aseptic connection is made with another such tube.

18. The automated system of claims 15 to 17, wherein the means for clamping a portion of the tube is a station of the processing system separate to the robotic device.

19. The automated system of claim 15 or 18, wherein the means for removing a section of the tube is a station of the processing system separate to the robotic device.

~~20. The automated system of claim 15, wherein at least one of: (i) the means for clamping a portion of the tube; and (ii) the means for removing a section of the tube, is configured as an end effector for a robotic arm.~~

~~21~~20. The automated system of any of claims 15 to ~~20~~19, wherein the means for removing a section of the tube comprises at least one of: a cutting blade and a heating device, for example a laser, an RF heater, and ultrasound heater, or an inductance heater.

~~22~~21. The automated system of claim ~~21~~20, wherein the means for removing a section of the tube is configured to remove a section of tube without directly contacting the tube.

~~23~~22. The automated system of any of claims 15 to ~~22~~21, further comprising means for manipulating the tube such that the pinched portion formed in the tube remains fluidly sealed when the tube is removed from the means for clamping.

~~24~~23. The automated system of any of claims 15 to~~23~~ 22, further comprising means for manipulating the tube, once joined with another such tube, to release the pinched portion whereby to establish a fluidic path through the joined tubes.

~~25~~24. The automated system of claim 15, wherein the means for manipulating a portion of the tube further comprises means for sterilising the second end of the tube.

~~26~~25. The automated system of claim ~~25~~24, wherein the tube further comprises an internal valve configured such that the flow of fluid or cell material into or out of the first container through the tube can be prevented when not connected to another such tube.

~~27~~26. The automated system of any of claims 15 to ~~26~~25, further comprising means for joining the second end of the tube with another such tube.

~~28~~27. The automated system of claim ~~27~~26, where the means for joining the tubes comprises means for welding the tubes together to form a tube weld.

~~29~~28. The automated system of claim ~~27~~26, wherein the means for joining the tubes comprises a connection piece configured to connect between the second end of the tube and the other such tube, preferably wherein the connection piece is configured to receive a sterilizing fluid, for example steam, once the tubes are fluidly connected whereby to create the aseptic connection.

~~30~~29. The automated system of claim ~~20~~15, wherein the end effector comprises at least one gripping unit configured to engage and move the tube.

~~31~~30. The automated system of claim ~~30~~29, wherein the tube comprises a holding device located around the tube, whereby the gripping unit grips the holder in order to engage and move the tube.

~~32~~31. The automated system of claim ~~31~~30, wherein the holding device is movable along a length of the tube, such that the tube can be translated through the holding device when the gripping unit grips the holding device.

~~33~~32. The automated system of claim ~~30~~29, wherein the tube has one or more protrusions on its external surface for the gripping unit to engage.

~~34~~33. A method of performing bioprocessing in a system having a series of processing stations for performing operations for bioprocessing using one or more containers, the method comprising:

configuring an automated system to:

manipulate a fluid connection between a first tube connected to a first container and a second tube connected to a separable second container whereby to create an aseptic connection that enables a controlled transfer of fluid or cell material between the first container and the second container,

wherein manipulating the fluid connection creates an aseptic connection that can be disconnected after the transfer of fluid or cell material is complete to enable a further such fluid connection to be manipulated between the first container and a separable third container; and

controlling an automated sequence of operation of the processing stations according to a predetermined workflow,

wherein the fluid connection is manipulated by a tube welder configured as an end effector for a robotic arm.

~~35~~34. The method of claim ~~34~~33, wherein the predetermined workflow is a reconfigurable bioprocessing workflow.