1. What, specifically, do the piping systems on the ISS consist of and do they differ from piping systems on earth due to the lack of gravity?

On Earth, water towers are used to provide most of the water pressure and pumps are used to back it up.  On the space station, the pumps fill up bellows --tanks that expand and contract to keep a consistent pressure for the line.  The bigger problem with microgravity is that any air in the line can act as a blockage.  With gravity, the air rises to the top and can be released from the system.  In microgravity the bubble can collect in areas and prevent the water from flowing or slow it down.

1. How, specifically, does NASA use silver to clean biofilm? Can we have more information about your current process?

On the Russian side, they use a silver biocide in the water to prevent microbes from growing in the lines however, even with the biocide present problems can occur that either allow biofilms to grow or equipment is introduced that isn’t completely clean

On the US side we use iodine in the water system to prevent microbial growth in the lines.  It is removed before it is consumed.  We have other wipes for cleaning up but it a different biocide instead of iodine.

1. Would/how would the lack of gravity constrain our design?
   * Bacteria are more virulent (harder to kill) on the ISS because of the stressors they are under (e.g., radiation) and the biofilm they form is in a different configuration because of microgravity.
     + This indicates that higher concentrations of the treatment may be needed to treat the same bacteria on the ISS.
       - You do not need to test your treatment in microgravity.
2. Is there any constraint we should have in mind while designing a solution? (besides the non-hazardous requirement)

* Non-hazardous (non flammable, not explosive, no toxic gas if on fire)
* Not required but would be good if:
  + it could be filtered out by an RO filter or it could be neutralized
  + there was a method to determine its concentration after treatment

1. How, specifically, does NASA use silver to clean biofilm?
   * Articles on iodine and silver for the ISS
     + <https://ntrs.nasa.gov/api/citations/20110014435/downloads/20110014435.pdf>
     + <https://ntrs.nasa.gov/api/citations/20205004059/downloads/ICES-2020-522%20final%20for%20Strives.pdf>
2. Can we have more information about your current process?
   * The chemical ingredients in Aequor's ISS water treatments are considered GRAS or approved as FDA food additives. The process included either the pre-treatment of the water for storage or treat the water recycling system via liquid injection.