**What is Gas Chromatography?**
Gas chromatography (GC) is an analytical technique that separates mixtures into their individual components utilising a mobile (gas or vapor) phase, allowing compound identification and quantification.

**How does GC work?**
In GC, a moving gas (the mobile phase) carries the sample across a stationary separation medium within the GC column (stationary phase). Volatile and semi-volatile components travel across the stationary phase while being pushed by the mobile phase. Sample components separate according to their differing affinity to the stationary phase as heat is applied.

**What is Intuvo?**
Intuvo changes the paradigm in GC and is Agilent’s new system which comprises capillary gas chromatographs, consumables and supplies. Based on numerous patented innovations designed to simplify the way GC is done, the Agilent Intuvo System greatly improves operational efficiency in the GC laboratory.
Transformations in the Intuvo GC System

Intuvo embodies three transformational innovations:

1. **Direct Heating**
   Unlike conventional GC systems using a convection air bath oven, Intuvo uses direct conductive heating to temperature program the entire flow path and analytical column. Direct heating uses less than half the power of a conventional air bath oven, takes about half the laboratory bench footprint, and can be heated and cooled much faster, improving throughput.

2. **Intuvo Click and Run Connections**
   Cumbersome ferrules used in conventional gas chromatographs are eliminated. Instead, advanced direct face seal connections are made with an audible and tactile ‘click’, telling the user a correct connection was made. Unplanned downtime and associated business disruption, so often encountered from leaks arising from incorrectly fitted ferrules, is eliminated.

3. **Intuvo Guard Chip and Trim-free Column**
   Intuvo is designed with a simple, disposable Guard Chip which serves as a pre-column retention gap. The Guard Chip traps unwanted material from depositing on, and damaging the head of the column. The need to trim columns is eliminated altogether, greatly enhancing productivity, while removing much of the art from GC operation.
What is the benefit of Intuvo for GC operators?

GC operators have told us that Intuvo is easy to manage and provides streamlined and dependable operation of the GC laboratory. This is achieved by:

A. Delivering better results
   - Intuvo direct heating is fast, reducing sample cycle time.
   - Changing an Intuvo column is over 10 times faster, improving uptime.
   - Eliminating column trimming and the associated recalibration and requalification time increases the instruments productive uptime, which in many cases can be used to run higher-value priority samples sooner.

B. Helping to eliminate mistakes
   Leaks and improper installation, associated with improperly fitted ferrules and improperly trimmed columns, are a major source of downtime. With Intuvo, fewer mistakes are made by eliminating ferrules and the need to trim columns. This avoids costly reruns and delays, holding up production, or losing valuable (sometimes unreplaceable) customer samples.

C. Improving operations
   Intuvo helps to drive sustainable operational improvement such as:
   - On-time delivery
   - Number of priority samples
   - Cost per billable sample
   - Resource and asset management
How does this compare with the current GC’s on the market?
Dimensions, materials of construction, and separation phases of the column are analogous to existing capillary GC. This all means that GC methods already developed for conventional air bath ovens are transferrable to the Intuvo system.
However, Intuvo comes with a number of features and benefits not seen with GCs on the market today. Intuvo shines most anywhere routine high throughput GC analyses are done. By streamlining the GC experience, including installation, setup, operation and maintenance, Intuvo transforms the way GC is done.

How does Intuvo change the role of the GC operator?
Intuvo greatly reduces complexity and makes accessible what used to be only within the realm of experts. Intuvo changes the way GC operators work by minimizing the time spent on routine tasks. It also minimises risks associated with maintenance as well as the time spent maintaining the GC, which in the past has been a worry for GC operators, due to the potential of lost productivity.