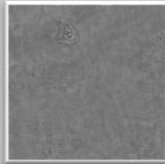
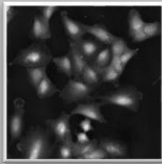


How are images formed

QPI: Quantitative Phase Imaging
QPI **increases contrast** in live cell imaging



Brightfield

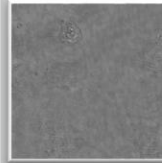


QPI

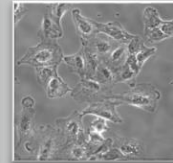
QPI is primarily based on an **algorithm** which retrieves the phase delay of light as it passes through the sample

QPI produces **high contrast label free** images

Phase contrast attempts to **increase contrast** in cell imaging



Brightfield



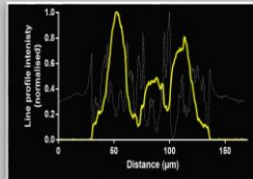
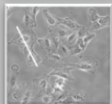
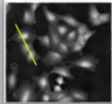
Phase contrast

This is achieved by an **optical design** which interferes light in a manner that **suppresses** the background intensity

The technique improves the contrast compared to brightfield
Phase contrast produces **medium contrast** images label free

Contrast in images

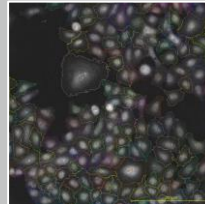
QPI and phase contrast image of **same** area



QPI — Phase contrast ---

QPI produces images of **higher contrast**

High contrast enables **automated segmentation** of every cell

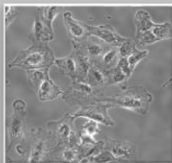


Segmentation of every cell enables **complex experiments** to be performed

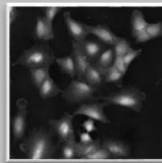
Segmentation of every cell enables more **comprehensive description** of cell behaviour

Key Advantages

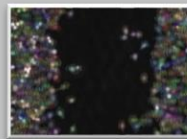
Indirect vs Direct Analysis



VS



Inability in Phase contrast to **individual segment** each cell means a **proxy measurement** must be employed to analyse the cells



QPI can measure the metric of interest **directly** i.e. the motility of an individual cell can be directly measured



Area of **Confluence** measurement

Phase contrast is traditionally limited to **less accurate** confluence metric as a **proxy measurement** i.e. confluence is used as a proxy measurement of motility

Summary

	Phase contrast	QPI
Contrast	☹️	😊
FOV	☹️	😊
Artefacts	☹️	😊
Quantitative nature of the data	☹️	😊
Throughput	😊	😊

Core Advantages of QPI

High contrast	Enables automated individual cell segmentation
Direct analysis	Enables complex analysis
Post-acquisition refocussing	Unaffected by focal drift over long-term time-lapse imaging