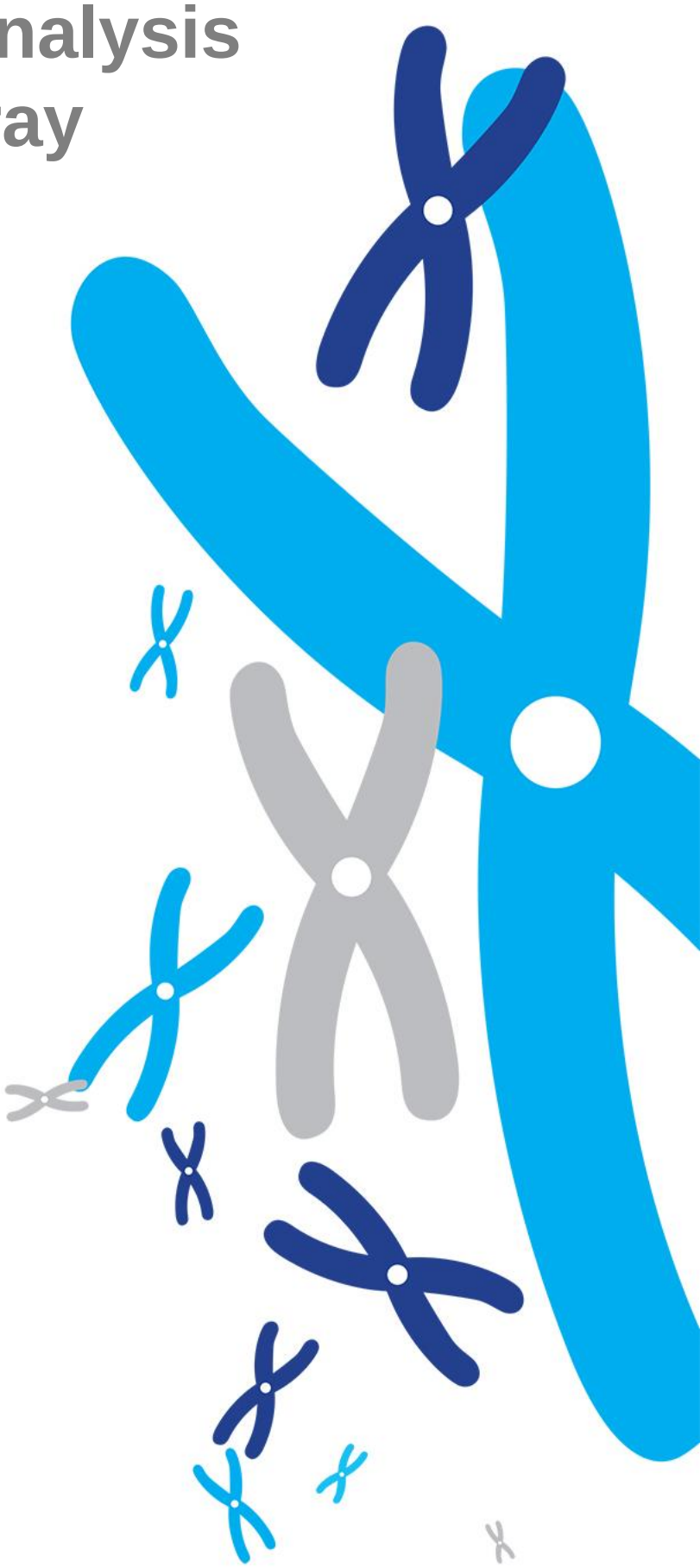
CELL guidance systems

Cytogenetic Service

Karyotype analysis and AGH array



Karyotype Service for Research

The gold standard of genetic audit required by regulatory agencies and journals.

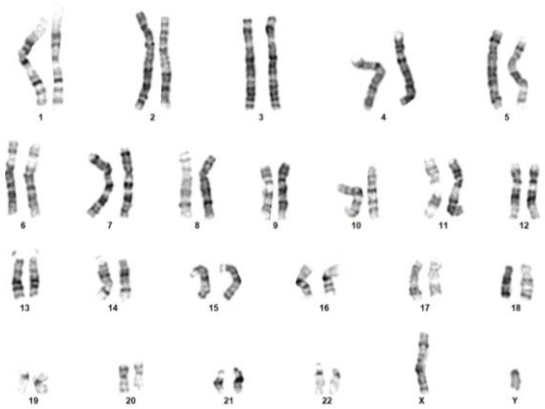
The need for Karyotype Analysis

Cells grown in vitro, such as induced pluripotent stem cells (iPSCs) and embryonic stem cells (ESCs), are prone to acquiring genetic abnormalities. Long term passaging and the genetic manipulation of cells can promote the development of such aberrations. This can undermine pluripotency and lead to misleading results in downstream experiments.

What can be detected?

Karyotype analysis is a cytogenetic test that enables the identification of numerical and structural chromosomal abnormalities. These include:

- Balanced Translocations
- Loss of heterozygosity
- Aneuploidy
- Low-frequency



Choose Cell Guidance Systems for:

- **Highly-cited service**
- **Express Option**
- **Depth of experience**
- **Customer support**

The leading karyotype service for researchers

Testing Methodology

Using conventional Giemsa staining techniques, condensed chromosomes are G-banded for observation. Chromosomes are subsequently grouped according to their size, centromere position and banding pattern, and any potential aberrations are identified. Karyotyping detects important balanced translocations. Array analysis is also beneficial as it provides a greater degree of resolution and can identify microdeletions that may be missed by karyotype analysis. Combine both analyses to achieve a comprehensive examination of genomic integrity.

Service Format

Live (BSL1 only) or fixed samples

Sample species include:

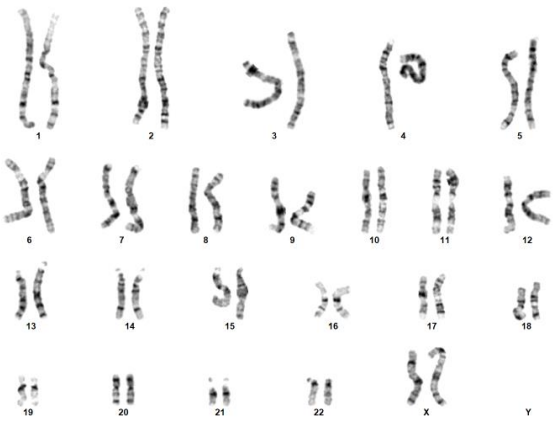
- Human
- Mice
- Please contact us about other mammalian species

Number of cells analyzed typically 20, 30, 40, 50, 60, or 100. Fewer for cancer cells

Reporting times:

- Fixed **Express** samples – Up to 5 business days (human only)
- Live **Express** samples – Up to 7 business days (human only)
- Standard samples – 10-15 business days

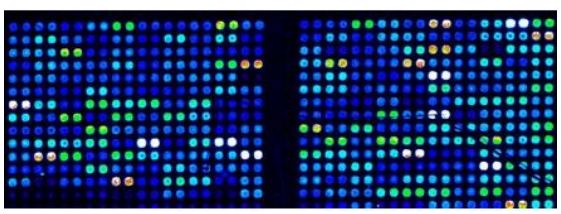
Contact us to check service availability
Karyotype@cellgs.com



Array Genomic Hybridization (AGH) Service for Research

What is array hybridization?

Array analysis utilizes slide-immobilized DNA probes which correspond to defined parts of the genome. DNA isolated from samples is fluorescently labelled and applied to these arrays, the resulting pattern of fluorescence is measured and compared to a physical control or a series of data sets in silico. A virtual map of probe copy number can be assembled based on the relative intensity of each probe. The results of this analysis are used for the detection and reporting of abnormalities that would be missed by traditional karyotyping methods.



What does Cell Guidance Systems offer?

The array service is offered in the form of **Array Genomic Hybridization (AGH).**

AGH is performed using Infinium Global Screening Array v3.0: The hybridization data from a single test DNA is compared with a series of control hybridizations in silico. The array has 750,486 distinct features.

Average resolution (median probe spacing)	2.3 kb
Probe size	50 mer
Copy number variation detection	Yes
Single nucleotide polymorphism (SNP) probes	Millions
Loss of heterozygosity detection	Yes
Mosaic detection sensitivity	>15%

Why perform array hybridization?

Array platforms offer a high-resolution analysis which allows for the detection and reporting of abnormalities that would be missed by G-banding. A much higher resolution of DNA dosage imbalances and loss of heterozygosity (LOH) can be characterized using array genome hybridization (AGH). Although this type of analysis has higher definition than karyotype analysis, it completely misses important balanced translocations and has great limitations for detecting mosaic cell populations.

G-banding and array analysis are complementary and should be used in combination to check that a cultured cell line remains chromosomally normal.

What type of abnormalities are reported?

Acquired copy number variations (CNVs) and loss of heterozygosity (LOH) present in at least ~15 – 20% of cells will be reported.

An assessment of normal variation is made with reference to ~5,000 normal control samples and a database of ~10,000 clinical samples. However, benign constitutional (heritable) CNVs will not be reported unless requested.

Balanced rearrangements and low level (10 – 20%) of mosaicism will not be detected using AGH.

We recommend array analysis for identifying marker chromosomes and additional material on a chromosome of unknown origin.

Visit www.cellgs.com for more information.

Cell Guidance Systems' reagents and services enable control, manipulation and monitoring of the cell, both *in vitro* and *in vivo*

Growth Factors
- Conventional (unformulated)
- PODS® - Sustained release

Exosomes
- Exo-spin™ - Purification
- ExoLISA™ - ELISA-like detection
- Instant Exosomes™ - purified and characterized
- NTA Service
- Freeze drying service

PeptiGel®
- Tunable self-assembling peptide hydrogels

Other products and services
- Small Molecules
- Softwell™ - 2D hydrogel (Europe only)
- Orangu™ - Cell counting reagent
- LipoQ™ - Lipid quantification assay
- Primary Hepatocytes

Cytogenetics
- Karyotype Analysis
- Array Hybridization

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