CELL guidance systems

Karyotype Service

Frequently Asked Questions

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Karyotype Analysis

Administration Questions

- **How do I book?**

Please contact us and we will confirm service availability for the dates you require. We will also send you our requisition form to be completed with details of the samples.

- **How do I send a PO?**

Booking the service online will automatically send a purchase order to our finance team. Alternatively, your admin team can e mail a PO directly to us at order@cellgs.com.

We require a PO before we can finish processing your samples and results will not be released until we have received this.

- **When can I expect results?**

Results can be expected within 10-15 working days for our standard service, and within 5 working days for our express service. We will contact you earlier if your sample fails our QC process to discuss next steps.

Logistical Questions

- **Can I drop off cells in person?**

Yes, you will find us in the Maia building on the Babraham Research Campus, CB22 3AT. Please call 01223 967316 or use the yellow phone by the door and we will come to collect your samples. Please do not leave samples on the foyer shelves.

- **Is there any specific courier that you recommend?**

We regularly receive international and regional deliveries from widely used carriers, such as FedEx or DHL, without issue.

- **How should I pack my sample?**

For live cells:

1. Seal the flasks with parafilm.
2. Enclose the flasks in a polystyrene box to insulate from temperature extremes.
3. Ensure the flasks will not move within the box by providing cushioning with bubble wrap.
4. Remember to enclose the purchase order.
5. Ship at ambient temperature (do not include ice packs).

We highly recommend that the live cells are only in transit for one day/night. In our experience, cells that have been shipped over two days do not sufficiently recover.

Further information can be found in our guide to preparing and shipping live cells for karyotype analysis.

For fixed cells:

Packaging for cell pellets fixed in methanol/acetic acid must be constructed with 3 layers:

1. Inner (primary) packaging. Re-suspend the cell pellet in 1.5 ml of fixative and place in a labelled 2 ml microcentrifuge tube. Tighten the cap and seal with parafilm. Do not fill the tube to the top. Leave room for liquid expansion.
2. Intermediate (secondary) packaging. Wrap the microcentrifuge tube in absorbent paper towelling and place the tube in a larger 50 ml centrifuge tube. Tighten the cap and seal with parafilm.
3. Outer packaging. Place the 50 ml tube in a sturdy, well-padded, cardboard box. Do not send samples in envelopes or similar unsuitable packaging. The dimension of the outer box must be at least 100 mm on two of the three sides.

Further information can be found in our guide to preparing and shipping fixed cells or fixed suspension cells.

- **How should I store my fixed cells prior to shipping for analysis?**

Once fixed, cells can be stored at 4ºC for around a month, longer than this cells should be stored at -20ºC.

- **How many flasks of live cells should I send?**

Live cells from one T25 flask usually provide enough metaphase cells for a 20 cell analysis once the fixation is completed. We require two flasks for a 40 or 60 cell analysis. You may send more than one flask if you wish, and we can select the most suitable one.

Analysis Questions

- **Can I have more than 20 cells analysed per sample?**

Yes, we typically offer 20, 40, 60 and 100 cell analyses. Other numbers can be considered, please contact us for a quote.

- **How many cells do I need to have analysed?**

Higher numbers of cells may allow detection of mosaicism with more confidence. Generally, a 20 cell analysis would allow detection of an abnormal clone of 14% of the total cells, and a 50 cell analysis would allow detection of a clone size of 6%, both with 95% confidence.

Mosaicism is the presence of cells with different karyotypes within the same sample.

- **Is it better to send fixed or live cells?**

If you have limited experience fixing cells, it may be best to send live cells as this will reduce the risk of samples failing QC. However, we need to receive live cells in our lab by Wednesday, at no more than 60% confluency.

For countries outside of Europe, we can only accept fixed cells, however these can arrive any day Monday-Friday.

- **What confluency should I send cells at?**

This depends on how actively the cells are dividing, but cells growing as a monolayer should arrive at Cell Guidance Systems laboratories by Wednesday at the latest, at no more than 60% confluency. This should ensure a suitable number of metaphase cells are obtained. We can perform media changes until cells are ready, but please send enough media to enable us to do this.

- **What resolution is karyotyping?**

The resolution of G banding is approximately 10Mb genome wide for stem cells karyotyped at CellGS, however this varies between samples and depends on cell type, and the optimisation of slide making and G banding conditions.

Higher resolution is offered by our SNP array analysis, however balanced rearrangements would not be detected, and karyotyping may also allow the detection of lower levels of mosaicism.

- **Can you karyotype organoids?**

Our experience is that karyotyping organoids is difficult and often unsuccessful. We can try to karyotype if you disperse cells, subculture, and harvest shortly after. We would advise our AGH service for testing of organoid cells, as this is usually successful.

Reporting Questions

- **What cytogenetic abnormalities do you report? Are there particular abnormalities you are looking for?**

We report many types of abnormality but particularly look to exclude structural and numerical abnormalities of chromosome 1, 12, 17, and X in human derived stem cells as these are reported to influence cell proliferation. In mice, abnormalities of chromosomes 8,10,11 and 14 are often seen.

- **Why and when do you report polyploidy in reports?**

We often see a few polyploid cells on slides, and this can be considered an artefact of culture. We report polyploidy when we see it at levels of >10-15% of total metaphases. Even in the presence of an otherwise normal diploid karyotype, this may indicate an underlying genetic instability.

- **Can you karyotype other species?**

We routinely karyotype human and murine cells and have experience karyotyping other mammalian cells. Please contact us for more info.

Quality Control Questions

- **Why did my sample fail QC? Will I be charged for sending a repeat sample?**

We do not charge for a repeat sample where we have failed a sample at the QC step. We will analyse a maximum of 3 repeat samples over a 3-month period.

Reasons for samples failing QC include:

- Poor chromosome quality (short metaphases, or cytosolic metaphases where the chromosomes have not spread well enough to allow analysis).
- Insufficient metaphases/low mitotic index. Analysis cannot be completed due to lack of suitable material.
- Insufficient G banding of chromosomes. Analysis cannot be completed due to lack of resolution, the distinct banding pattern of the chromosomes is lost. This occasionally occurs if samples are extremely cytosolic or if the sample fixation was incorrect.

- **How do you dispose of our samples?**

Cells are kept for 3 months following the karyotype report being issues. If no further instructions are received, we dispose of these samples by pooling fixed suspensions, which renders the cells unidentifiable/untraceable.

- **Can we access your standard operating procedures (SOPs)?**

Our internal SOPs are controlled documents, and not available for public circulation. We understand some customers may need some information from them for regulatory purposes. Please contact us 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
- Recombinant
- PODS® Sustained Release

Exosomes
- Purification
- Detection
- Purified Exosomes
- NTA Service

Cytogenetics
- Karyotype Analysis
- Array Hybridization

Defined Surfaces and ECMs
- PeptiGels®
- Matrigen Softwell®
- Matrix Proteins

Other research products and services
- Primary Human Hepatocytes
- Small Molecules
- Cell Counting Reagent
- Lipid Quantification Assay

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