



- Cytogenetic Laboratory requisition forms for cytogenetic analysis, chromosomal microarray (CMA) and fluorescence *in situ* hybridization (FISH) tests are available from the laboratory by fax, email, or on the cytogenetics website. The current web address is:
<http://genetics.medicine.iu.edu/divisions/diagnostic-genomics/cytogenetics/cytogenetics-requisition-forms/>
The appropriate requisition sheet should be completed by the physician, nurse, or physician's representative and accompany each sample.
- Please fill in all lines on the request form. Clinical information is necessary to help direct the analysis and interpretation.
- Specimens should be sent in a plastic ziplock biohazard bag, and paperwork placed in a separate bag or envelope. **The paperwork should not be placed in the same bag as the specimen.**
- For media and supplies (amniocentesis kits and/or bone marrow or tissue transport media), please phone the laboratory at (317) 274-2243. Frozen transport media should be stored in the freezer and completely thawed before usage.
- If a specimen is: 1) received in the incorrect container; 2) mislabeled; 3) of an insufficient quantity; or 4) otherwise of poor quality, the laboratory assistant or other staff member will contact the referring physician and, if possible, the person responsible for collecting the specimen, to alert them of the problem. In instances of mislabeling, written documentation clarifying the identity of the specimen is required from the individual who collected the specimen. If written documentation is not provided, the specimen will be discarded.
- To change test orders (e.g. add FISH studies), a physician may do so over the phone. A written order requesting the additional test must follow. Signed FAX orders are permitted.

Overnight Shipping Information

Outside of Indianapolis, please ship by FedEx or other overnight courier to:

IU Cytogenetic Laboratories
Department of Medical and Molecular Genetics
975 West Walnut Street
IB 265
Indianapolis, IN 46202-5251

Please call the laboratory and alert us that a specimen is en route.

Data Manager/Office – (317) 274-2243
Laboratory Manager – (317) 274-5219
Laboratory Assistant – (317) 278-6528
Prenatal Laboratory – (317) 274-2246
Leukocyte/FISH Laboratory – (317) 274-1053
Cancer Cytogenetics Laboratory – (317) 274-1054

Shipped samples should **not** arrive on Sunday. If a sample must arrive on a Saturday or on a designated holiday, the laboratory personnel should be informed to ensure that someone is available for receipt and processing. If sending a sample via FedEx for a Saturday delivery, make sure "Saturday Delivery" is indicated on the airbill. Shipping guidelines can be found online at <http://phmsa.dot.gov/hazmat>. From the main page, go to "Regulations", and then go to "Hazardous Materials Regulations (Title 49 CFR Parts 100-185)". From this page, go to subchapter C and click on "173.1 to 173.477", then click on "173.199"- Category B Infectious Substances.

Delivery Information

There is a loading dock behind the Medical Research and Library Building (IB) for short-term parking during delivery, and a pedestrian tube from University Hospital connects directly to the second floor of the Medical Research and Library Building for in-house delivery.

Laboratory Hours

The laboratory is open from 7:30 a.m. to 5:30 p.m. Monday - Friday and 8:00 a.m. to 4:00 p.m. on Saturday. The laboratory office is open from 8:30 a.m. to 5 p.m. Monday – Friday. Holidays are covered by “on call” staff.

Collection of Specimens for Cytogenetic Analysis:

1. **Peripheral Blood for Chromosome and/or FISH Analysis:** [**Sodium heparin tubes**]. 2-10 mL of blood are collected into sodium heparinized tubes (green top) (2-4 mL for infants; 7-10 mL for adults) (**sodium heparin only**). **DO NOT FREEZE**. Keep at room temperature. Final results should be available in 7-10 days for standard chromosome analysis. Preliminary results of RAPID specimens are provided within 3 days and final results within 7 days. The referring physician will be notified if results are abnormal or if cultures result in no growth or contamination.
2. **Peripheral Blood for Chromosomal Microarray (CMA):** [(**1 Sodium heparin and (1) EDTA tube**)]. 3 mL whole blood per tube are collected into one purple-top (EDTA) and one green-top sodium heparin vacutainer. **DO NOT FREEZE**. Keep at room temperature and deliver or ship specimen. Results should be available in 10-14 days. Specimens not meeting criteria listed in next section #6 are subject to rejection.
3. **Amniotic Fluid:** [**Sterile tubes (provided by the laboratory)**]. 10-25 mL of amniotic fluid are collected at 14 weeks of gestation or greater (or alternatively 1 mL/week of gestation for amniocentesis between 12 and 14 weeks) in a sterile syringe. **The first 2-3 mL of aspirated fluid is discarded or placed in a tube labeled “0” to avoid maternal cell contamination.** The remaining specimen is transferred to sterile centrifuge tubes in 3-4 sterile aliquots, labeled 1st, 2nd, etc., and transported to the laboratory within 24 hours. The amniotic fluid should be refrigerated if there is a delay in transport. If the fluid sample is bloody, sterile centrifuge tubes containing sodium heparin should be used (these tubes are also available upon request). Results and final reports are faxed in 7-10 days. The referring physician and/or genetic counselor may be notified if the date of preliminary report exceeds 8 days.
4. **Chorionic Villi Specimens (CVS):** [**Sterile container with transport media (provided by the laboratory)**]. 20-30 mg (50 mg if FISH is requested) of chorionic villi are collected either transabdominally or transcervically, placed in CVS transport media, and transported at room temperature to the laboratory within 24 hours. The sample should be refrigerated if there is a delay in transport. Preliminary results should be available in 7-10 days, and the physician and/or genetic counselor may be contacted if the preliminary report exceeds 9 days.
5. **Bone Marrow Specimens for Chromosome and/or FISH Analysis of Hematologic Disorders:** [**Sodium heparin vacutainer, heparinized syringe, or media in flasks (provided by the laboratory)**]. Two mL of bone marrow aspirate are collected into a heparinized syringe using the first draw or a repositioned needle and placed in containers of medium supplied by this laboratory or into sodium heparinized vacutainer. **DO NOT FREEZE**. Keep at room temperature. Preliminary results are communicated within 5-7 days, and final reports within 7-10 days. The referring physician may be notified if the date of preliminary report exceeds 10 days.
6. **Rapid Bone Marrow Specimens (For urgent diagnosis in newborns):** [**Sodium heparin vacutainer, heparinized syringe, or media in flasks (provided by the laboratory)**]. A bone marrow aspirate (~ 1 mL) is collected into a heparinized syringe and placed in containers of medium supplied by this laboratory. **DO NOT FREEZE**. Keep at room temperature. Results are available in three to four hours. The physician will also be notified immediately if cultures result in no dividing cells for analysis.

7. **Solid Tumors: [Sterile container with transport media (supplied by the laboratory)].** Solid tumor specimens must be collected aseptically, placed in medium supplied by the laboratory and immediately transported to the laboratory. If there is a delay in shipping, the specimen should be refrigerated. Time for analysis varies with rate of tumor growth, but most results are typically available in 7-10 days.
8. **Paraffin-embedded Tissue (PET): [Tissue Sections].** Four-micron tissue sections from formalin-fixed, paraffin-embedded blocks on positively-charged slides are used. Two to three slides per target area are sufficient. The laboratory does not accept blocks. The tissue must be fixed in 10% buffered formalin and the total time of exposure to formalin should be recorded when available. A specimen should be accompanied by normal tissue of the same type to be used as a control and when available, or an H & E stained slide with the tumor area marked. A pathology report of the tissue to be studied must also be received. **Decalcified bone specimens will not be accepted.**
9. **Tissue from Spontaneous Abortions, Stillborns, Terminations or Autopsy Specimens: [Sterile container with transport media (supplied by the laboratory)].** 3-10 mm³ of tissue is collected aseptically and placed in tissue transport media. If tissue transport media is unavailable, use any type of sterile media in a sterile container. Villi is preferred, although fetal cartilage, membrane or tendon are acceptable. Tissue from fetal organs (lung, liver, etc.) and skin typically is not viable. Do not send the entire fetus. Each tissue type should be placed in a separate collection media. Do not clean fetal skin with betadine or any antiseptics with metal ions. Seventy percent alcohol is preferred. The specimen should be transported at room temperature to the laboratory within 24 hours of collection, and it should be refrigerated if there is a delay in transport. Specimens received in the laboratory later than four days after collection may be rejected. Time for analysis varies with rate of tissue growth, but most results are ready in 12 to 14 days. SINCE LIVING CELLS ARE REQUIRED, THE SPECIMEN SHOULD NOT BE FROZEN, PLACED ON ICE OR DROPPED INTO FIXATIVE. DO NOT PLACE TISSUE IN FORMALIN OR SALINE.
10. **Skin Biopsies or Surgical Specimens: [Sterile container with transport media (supplied by the laboratory)].** The skin should be cleaned with 70% ethanol and not antiseptics with metal ions, such as betadine. A skin punch or surgery skin specimen is collected aseptically and placed in tissue transport media (available upon request). If tissue transport media is unavailable, use any type of sterile media in a sterile container. The sample should be transported at room temperature to the laboratory within 24 hours of collection, and it should be refrigerated if there is a delay in transport. If the skin sample is for culturing for a send out test, a completed requisition form for the send out laboratory must also accompany the sample. If the sample is for cytogenetic analysis, a result should be available in approximately 21 days. The physician or genetic counselor will be contacted if the report exceeds 25 days. SINCE LIVING CELLS ARE REQUIRED, THE SPECIMEN SHOULD NOT BE FROZEN, PLACED ON ICE OR DROPPED INTO FIXATIVE. DO NOT PLACE TISSUE IN FORMALIN OR SALINE.
11. **Urine for UroVysion FISH Analysis: [Sterile container].** These specimens may only be utilized for UroVysion FISH studies for cases of hematuria, bladder cancer, or suspicion of bladder cancer. For urine, a minimum of 50 mL are collected in centrifuge tubes or other tightly-capped plastic container. First morning void is preferred. DO NOT FREEZE. Keep at room temperature. The sample should be transported to the laboratory within 24 hours of collection, and it should be refrigerated if there is a delay in transport. Specimens received in the laboratory later than four days after collection will be subject to rejection. A pathology report of the specimen to be studied must also be received if available. Final results should be available within 2 days of sample receipt.
12. **Biliary Strictures: [Sterile container with ThinPrep PreservCyt® Solution from Hologic].** These specimens are collected for FISH studies utilizing centromere probes from chromosomes 3, 7, and 17 and

a locus-specific probe for CDKN2A on 9p21. Biliary brushings or fluid collected via an ERCP (Endoscopic Retrograde Cholangiopancreatography) procedure should be transported to the laboratory at room temperature within 24 hours of collection. If there is a delay in transport the sample should be refrigerated (DO NOT FREEZE). Specimens received in the laboratory later than three days after collection will be subject to rejection. Final results should be available within two days of sample receipt unless received on Friday afternoon.

Criteria for Rejection of Specimens

Fresh specimens [non-Paraffin Embedded Tissue (PET)] received that are older than **four days** are subject to rejection. In this case, the physician or physician's representative will be contacted to determine the suitability of testing. After the laboratory staff explains the likelihood of successful testing, if the physician indicates that testing is still warranted, the patient will be billed full charge and testing will be initiated. Clotted specimens or specimens that may be otherwise rejected may be accepted if another sample cannot be obtained.

Specimens are subject to rejection if:

1. Unlabeled, frozen, or grossly contaminated;
2. Packaged in improper containers;
3. The incorrect tissue type is sent;
4. Exposed to extreme temperatures;
5. Inadequate amount or volume;
6. Non-PET specimens have been placed in formalin;
7. Received in the laboratory after an extended period of time (4 days or more).
8. Decalcified bone specimens.

Specimens that are mislabeled should be recollected if possible. If it is not possible to obtain a second specimen that is correctly labeled, a record should accompany the requisition form detailing the incident and which corrective actions were taken. There must be a signed document received regarding mislabeled specimen if a second specimen is not obtained.

The physician will be notified immediately if a specimen is considered unacceptable.

Specific rejection criteria for the different specimen types are given below:

1. Amniotic Fluid Specimens: Amniotic fluid may be rejected if it is frozen, clotted, more than four days old, or collected in non-sterile or improper containers.
2. Chorionic Villus Specimens: Chorionic villus specimens may be rejected if there is less than 1 mg of tissue, or if the tissue is dehydrated, more than 48 hours old, sent in an open container, shipped in saline rather than medium, or frozen or placed in formalin.
3. Other Tissue Specimens: Other tissue specimens that have been placed in formalin (prior to culture) are rejected. Tissue specimens that are collected in saline or in an incorrect (non-sterile) container, frozen, more than 4 days old, or grossly contaminated may be rejected.
4. Bone Marrow and Tumor Specimens: Bone marrow and tumor specimens that are more than 96 hours old, collected into the wrong tube (lithium heparin, EDTA), frozen, clotted, collected in saline or inadequate in amount (<0.5 mL of bone marrow) are subject to possible rejection.
5. Peripheral Blood Specimens for Chromosomes and/or FISH Analysis: Peripheral blood samples for cytogenetic analysis that are more than 4 days old, clotted or collected in EDTA or lithium heparin vacutainer tubes (for 24 hour or longer), frozen or on ice, or lacking identifying information on the tube may be rejected. Specimens from patients recently transfused (< 1 week) with whole blood are discouraged.

6. Peripheral Blood Specimens for Chromosomal Microarray (CMA): Peripheral blood samples for CMA analysis that are more than 3-4 days old, do not meet volume requirements, are clotted, collected in lithium gel vacutainer tubes (for 24 hour or longer), frozen or on ice, or lacking identifying information on the tube, may be rejected.
7. Paraffin-Embedded Tissue (PET) FISH Analysis: Analysis can only be completed on tissue preserved in 10% buffered formalin. Do not send blocks. HER2 testing should only be performed on cases of invasive breast cancer or gastric cancer. DECALCIFIED BONE SPECIMENS ARE NOT ACCEPTED FOR FISH ANALYSIS.
8. Urine Specimens for UroVysion FISH Analysis: Urine samples for UroVysion FISH analysis that are more than 24 hours old, do not meet volume requirements, are frozen, lacking identifying information on container, grossly contaminated, or collected in non-sterile or improper containers may be rejected.
9. Biliary Strictures for FISH Analysis: Biliary brushings or fluid samples for FISH analysis that are kept at room temperature for more than 48 hours, lacking identifying information on the specimen container, grossly contaminated, or collected in non-sterile or improper containers may be rejected.