

RECOMMENDED CYTOGENETIC TESTS SELECTION *for* ONCOLOGY SERVICES

The selection of cytogenetic testing and combinations of specific FISH probes, frequently referred to as "*FISH panels*", utilized for the evaluation of many disease entities is widely varied and actively debated among the clinical community. With an ever increasing knowledge base and the ongoing development and availability of applicable DNA probes, the potential combinations for FISH panels will undoubtedly continue to evolve.

In an attempt to ensure that appropriate patient care is achieved in an efficient manner, we are providing the following recommended ordering guidelines. Our recommendations are based, in part, on a "*minimal consensus*"; however, we also highly recommend an algorithmic approach, where applicable*. Although much attention has been given to the speed of FISH studies, it should be noted these types of studies are limited to the availability** of specific DNA probes and only address focused inquiries/questions.

*Whereas, a conventional cytogenetic analyses can function as a global chromosome screening tool, and in most cases can provide preliminary data **within a 24 period** for those critical cases requiring immediate management needs.*

For routine cases, a chromosome or karyotype screen remains to be an accurate method for identifying acquired chromosomal changes and will most often provide additional insight to those cases requiring ancillary FISH testing for diagnostic and prognostic purposes, thereby eliminating the need for costly and unnecessary FISH testing.

It is important that the referring clinicians notify the laboratory of morphology, phenotype, and/or other findings which suggests a specific cytogenetic aberration not found by conventional cytogenetics. Please note, that our recommendations are intended to represent **minimal ordering guidelines only** and as always, ordering physicians may tailor their ordering practices to include or exclude specific tests as needed to fit their patient's needs.

**Reflexive testing is not possible without institutional approval and individual physician acknowledgment of algorithms intended; however, additional FISH studies can be subsequently ordered for most studies post karyotype screening when necessary.*

***FISH testing is limited to the availability of specific DNA probes that have been validated for clinical use by our laboratory.*

*Note: Our cytogenetics laboratory **does not** perform mutational analyses by molecular methods (i.e., PCR), please forward these requests to an appropriate molecular laboratory and/or send-out laboratory services.*

*Please contact the laboratory at (352) 265-9900 **prior** to ordering STAT studies or FISH studies not listed on our requisition form.*

UFDRL

UF Cytogenetics Laboratory
4800 SW 35th Drive
Gainesville, FL 32608
(352) 265-9900

Disease Group <i>at diagnosis</i>	Cytogenetics (CG)	FISH
MDS	Yes <i>Rearrangements unlikely to be cryptic</i>	Not necessary for CG positive cases; interphase FISH for 5q, 7q, 20q deletions if; 1. complexity of abnormal karyotype dictates 2. conventional cytogenetic analysis has failed
?MDS <i>(does not conform to WHO or FAB subtypes)</i>	No	No
AML (not M3)	Yes	Not necessary for CG positive cases; Metaphase and interphase FISH for ETO/AML1* and CBFb , if; 1. cytogenetics negative 2. complexity of abnormal karyotype dictates 3. conventional cytogenetic analysis has failed <i>*The use of ETO/AML1 will detect incidences of trisomy 8, therefore, a separate FISH study for trisomy 8 is not necessary</i> <i>May wish to consider MLL, BCR/ABL, 5q, 7q, only if all FISH and CG studies negative and clinical findings warrant</i>
APL	Yes	1. rapid cytogenetics plus FISH for PML/RARa only; 2. cytogenetics negative cases will be performed for "cryptic" PML/RARa if morphology dictates
CML	Yes	BCR/ABL <i>Useful to classify aberrant hybridization patterns, atypical/variant patterns and/or presence of deleted 9q subgroups, especially for potential use in follow-up studies</i>
B-ALL (pediatric)	Yes	Not necessary for hyperdiploidy CG positive cases; interphase FISH for 4/10/17 trisomies, if: 1. quality or resolution insufficient to characterize Not necessary for CG positive cases; metaphase and interphase FISH for BCR/ABL, MLL, TEL/AML1 , if; 1. cytogenetics negative 2. conventional cytogenetics analysis failed
T-ALL (adult)	Yes	NO

Disease Group <i>at diagnosis</i>	Cytogenetics (CG)	FISH*
B-ALL/biphenotypic ALL (adult)	Yes	BCR/ABL
Lymphoma (on lymph node biopsy)	Yes	Not necessary for CG positive cases; metaphase and interphase FISH for c-MYC, IGH, BCL2, OR BCL6 break-aparts as <i>histo or immunostained indicated</i> if; 1. cytogenetics negative 2. conventional cytogenetics analysis failed 3. complexity of karyotype dictates
Lymphoma (marrow involvement)	Yes (if marrow is abnormal)	Not necessary for CG positive cases; metaphase and interphase FISH for c-MYC, IGH, BCL2, OR BCL6 break-aparts as <i>histo or immunostained indicated</i> if; 1. cytogenetics negative 2. conventional cytogenetics analysis failed 3. complexity of karyotype dictates <i>Additional specific probes (i.e., n-MYC) that have been previously identified when FISH positive on other tissue</i>
Multiple Myeloma	Yes	Not necessary for CG positive cases that include chromosome 13 deletions or 14q32 rearrangements, metaphase and interphase FISH or del(13q), IGH rearrangements, if; 1. cytogenetics negative 2. conventional cytogenetics analysis failed 3. complexity of karyotype dictates <i>May wish to consider requesting interphase FISH for 5, 15 aneuploidies for CG and FISH 13q and IGH negative cases</i>
CLL/SLL	Yes	Not necessary for CG positive cases; interphase FISH for ATM, +12, del(13q), and p53 if; 1. cytogenetics negative 2. conventional cytogenetics analysis failed 3. complexity of karyotype dictates
Solid Tumor	Yes	Not necessary for cytogenetically positive cases, unless 1. complexity of abnormal karyotype dictates 2. differential dictates treatment/management (i.e., EWSR1) 3. failed cytogenetic analysis

<p>Disease Group <i>at follow-up</i></p>	<p>Cytogenetics (CG)</p>	<p>FISH*</p>
<p>Residual disease assessments</p>	<p>Yes</p>	<p>Not necessary for cytogenetically positive cases; interphase FISH for previously detected primary rearrangements* only if;</p> <ol style="list-style-type: none"> 1. cytogenetics negative 2. failed cytogenetic analysis <p><i>*FISH for previously identified secondary clonal changes should not performed</i></p>
<p>BMT patients (sex-mismatched)</p>	<p>Yes (mitotic status of recipient may be of value)</p>	<ol style="list-style-type: none"> 1. X/Y FISH 2. primary disease markers previously identified in primary study, if host cells are present
<p>CML <i>at follow-up</i></p>	<p>Yes (to screen for secondary changes)</p>	<p>Not necessary for CG positive cases; interphase FISH for BCR/ABL if:</p> <ol style="list-style-type: none"> 1. cytogenetics negative 2. conventional cytogenetics analysis failed
<p>Marrow involvement of any neoplastic process</p>	<p>No if marrow normal</p> <p>Yes if marrow abnormal</p>	<p>Not necessary for cytogenetically positive cases; interphase FISH for previously detected primary rearrangements* only if;</p> <ol style="list-style-type: none"> 1. marrow abnormal and cytogenetics negative or 2. failed cytogenetic analysis
<p>Other Tissues</p>	<p>Yes (Based on a presumed CG study from appropriate sample)</p>	<p>Not necessary for cytogenetically positive cases; interphase FISH for previously detected primary rearrangements* only if;</p> <ol style="list-style-type: none"> 1. failed cytogenetic analysis <p>Only if needed to confirm or characterized CG findings</p>

RECOMMENDED ONCOLOGY CYTOGENETIC TESTING SERVICES

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Myelodysplastic Syndromes

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Multiple Myeloma

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AML

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APL

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CLL/SLL

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