# Cytogenetic Findings in Childhood Lymphoblastic Lymphoma: Preliminary report from the Children’s Oncology Group Phase III study COG A5971

Marilu Nelson, B.S.1, Bhavana J. Dave, Ph.D.2, Nyla A. Heerema, Ph.D.2, Sherrie L. Perkins, M.D.2, Mitchell S. Cairo, M.D.2, Mark A. Lones, M.D.2, and Warren G. Sanger, Ph.D.1,2

1 Munroe-Meyer Institute, University of Nebraska Medical Center, Omaha, NE and 2 Children’s Oncology Group Study Group:

## Study Group:
- COG study group A5971
- Newly diagnosed lymphoblastic lymphoma patients
- 72 cytogenetic cases sent for central review
  - 47 cases with unacceptable cytogenetic results
  - 25 cases with acceptable cytogenetic results
- Immunophenotype of 25 accepted cases
  - 13 cases precursor T-cell
  - 2 cases precursor B-cell
  - 1 case precursor B&T-cell
  - 9 cases not otherwise specified (NOS)
- Age at dx: 3 - 17 years of age
- 4 cases with relapse
  - Cases a, b, c, d described in results

## Objectives:
- Identify and determine incidence of recurring chromosomal abnormalities in lymphoblastic lymphoma.
- Correlate karyotype with morphology, immunophenotype and clinical features.

## Results:

### 23 of 25 cases with abnormal cytogenetic results (92%)
- 22 near-diploid cases (modal# 45-51), 1 case near-tetraploid (modal# 87-92)
- 6 cases with 11q21-q23 abnormalities
  - 4 possible MLL disruptions at 11q23
  - 2 B-cell, 2-Tcell, 2 NOS
  - 1 Relapse (b)
- 5 cases with 6q13-q23 deletions
  - 6q21 recurrent deletion region
  - 3 T-cell, 1 B-cell, 1 NOS
  - 1 Relapse (c)
- 5 cases with 1q21-q44 abnormalities
  - 2 T-cell, 2 NOS, 1 B-cell, 1 Relapse (c)
  - 3 T-cell, 1 B-cell, 1 Relapse (c)
- 4 cases with 7p11.2-p15 abnormalities
  - 2 T-cell, 2 NOS, 1 Relapse (c)
  - Deleted 7p14 (TGR locus)
- 4 cases with 1p22-p34 abnormalities
  - 2 T-cell, 2 NOS
  - 3 T-cell, 1 B-cell, 1 Relapse (c)
  - 1 Relapse (c)
- 4 cases with 14q11.2 translocations
  - TcR alpha/delta gene at 14q11.2
  - Variable translocation partner in each case
  - 2 T-cell, 2 NOS
- Only repeated translocation: t(10;11)
  - 2 cases t(10;11)(p13;q21)
    - AF10/PICALM fusion
    - 1 T-cell, 1 NOS
  - 1 case t(10;11)(p13;q23)
    - AF10/MLL fusion
    - B-cell
  - AF10/PICALM previously reported:
    - LBL (1.5%), ALL (<0.1%), AML M0 (1.0%)
  - AF10/MLL previously reported:
    - LBL (none per Mitelman’s database), ALL (0.03%), AML M5 (1.0%)
- Translocation unique to LBL: t(9;17)
  - 1 case t(9;17)(q34;q23)
    - Immunophenotype NOS
    - Relapse (case b)
  - 3 previously reported cases in LBL
    - Incidence rate of 1.7%
  - Previously associated with poor prognosis
    - NOTCH1 gene at 9q34

## Conclusions:
- Chromosomal aberrations occur frequently (>90%) in LBL.
- Recurrent, disease-specific abnormalities present.
- Shared abnormalities with AML and ALL occurring at different frequencies.