**INTRODUCTION**

The molecular detection of the BCR-ABL fusion transcripts is necessary for the genetic confirmation of Chronic Myeloid Leukemia (CML) diagnosis and for the risk classification of Acute Lymphoblastic Leukemia (ALL) [1,2]. The molecular identification for this purpose is actually based on conventional RT-PCR [3]: the main limitations are long-time-to-result and multi-step procedures that often cause a slow-down of diagnostic laboratories routine activity. Here we present a novel molecular method, based on Loop Mediated Amplification (LAMP) [4] reaction that, coupled with the Liaison IAM instrument (DiaSorin SpA), ensures semi-automated rapid detection of BCR-ABL p190 and p210 fusion transcripts and of the endogenous GUSβ mRNA.

**METHODS**

BCR-ABL multiplex fluorescent RT-LAMP assay has been developed to detect and distinguish the two fusion transcripts (p190 and p210) of the BCR-ABL translocation.

**RESULTS**

Conventional RT-PCR (Biomed protocol) [5]

- **p190 Positive Cell Line (TOM1)** serially diluted into Negative Cell Line (HEL60)
  - ID<sup>1</sup>: 2 100%
  - ID<sup>2</sup>: 3 100%
  - ID<sup>3</sup>: 111 100%
  - ID<sup>4</sup>: 30 97.4%
  - Total: 136

- **p210 Positive Cell Line (K562)** serially diluted into Negative Cell Line (HEL60)
  - ID<sup>1</sup>: 2 100%
  - ID<sup>2</sup>: 16 100%
  - ID<sup>3</sup>: 25 100%
  - ID<sup>4</sup>: 124 100%
  - ID<sup>5</sup>: 45 100%
  - Total: 210

**RT-LAMP is HIGHLY SPECIFIC**

- **p190**
  - Results by RT-LAMP: 100% sensitivity
  - Results by conventional RT-PCR: 100% sensitivity

- **p210**
  - Results by RT-LAMP: 100% specificity
  - Results by conventional RT-PCR: 100% specificity

**CONCLUSIONS**

The triplex p190-p210-GUSβ RT-LAMP is a one-step procedure for specific, highly sensitive and rapid molecular detection of the BCR-ABL fusion transcripts. The semi-automated approach on the instrument Liaison IAM allow to simplify the entire procedure, reducing the contamination risks deriving from the conventional, multi-step RT-PCR, thus resulting in a significantly improvement of the diagnostic lab routine.

**REFERENCES:**

[2] National Cancer Institute 2010
[5] [Biomed protocol](https://www.biomedprotocol.com)