

| $\Delta$ Ex4-7 |   |                  |                            |                  |                  |                            |                    |                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                          |     |  |  |
|----------------|---|------------------|----------------------------|------------------|------------------|----------------------------|--------------------|----------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|-----|--|--|
|                |   | 46 101<br>46 102 | 46 103<br>46 104<br>46 105 | 46 106<br>46 107 | 46 108<br>46 109 | 46 110<br>46 111<br>46 112 | 46 113             | 46 114<br>46 115<br>46 116 | 46 117<br>46 118<br>46 119<br>46 120<br>46 121<br>46 122<br>46 123<br>46 124<br>46 125<br>46 126<br>46 127<br>46 128<br>46 129<br>46 130<br>46 131<br>46 132<br>46 133<br>46 134<br>46 135<br>46 136<br>46 137<br>46 138<br>46 139<br>46 140<br>46 141<br>46 142<br>46 143<br>46 144<br>46 145<br>46 146<br>46 147<br>46 148<br>46 149<br>46 150<br>46 151<br>46 152<br>46 153<br>46 154<br>46 155<br>46 156<br>46 157<br>46 158<br>46 159<br>46 160<br>46 161<br>46 162<br>46 163<br>46 164<br>46 165<br>46 166<br>46 167<br>46 168<br>46 169<br>46 170<br>46 171<br>46 172<br>46 173<br>46 174<br>46 175<br>46 176<br>46 177<br>46 178<br>46 179<br>46 180<br>46 181<br>46 182<br>46 183<br>46 184<br>46 185<br>46 186<br>46 187<br>46 188<br>46 189<br>46 190<br>46 191<br>46 192<br>46 193<br>46 194<br>46 195<br>46 196<br>46 197<br>46 198<br>46 199<br>46 200 |                          |     |  |  |
| Ref. seq.      | → | ... TA           | TTA                        | GT               | AC               | ATC                        | C                  | CAC                        | ...                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | TTGCTGTGGAACATCAAGTCTAGT | ... |  |  |
| ▶ 4            | → | ... TA           | TTA                        | GT               | AC               | ATC                        | C                  | CA                         | ...                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | -----AACATCAAGTCTAGT     | ... |  |  |
| ▶ 5            | → | ... TA           | TTA                        | GT               | AC               | ATC                        | C                  | C                          | ...                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | -----TCAAGTCTAGT         | ... |  |  |
| ▶ 6            | → | ... TA           | TTA                        | GT               | AC               | ATC                        | CAAGAAGG           | ---                        | ...                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | -----AACATCAAGTCTAGT     | ... |  |  |
| ▶ 7            | → | ... TA           | TTA                        | GT               | AC               | ATC                        | CGGGAG             | ---                        | ...                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | -----TCAAGTCTAGT         | ... |  |  |
| ▶ 8            | → | ... TA           | TTA                        | GT               | AC               | ATC                        | CTGGGTTGAGGAAATCAT | ---                        | ...                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | -----AAACATCAAGTCTAGT    | ... |  |  |
| ▶ 9            | → | ... TA           | TTA                        | GT               | AC               | ATCG                       | -                  | ---                        | ...                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | -----GGAACATCAAGTCTAGT   | ... |  |  |
| ▶ 10           | → | ... TA           | TTA                        | GT               | AC               | ATCT                       | -                  | ---                        | ...                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | -----GAAACATCAAGTCTAGT   | ... |  |  |
| ▶ 11           | → | ... TA           | TTA                        | GT               | AC               | ATCCCTTAGGG                | -                  | ---                        | ...                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | -----AACATCAAGTCTAGT     | ... |  |  |
| ▶ 12           | → | ... TA           | TTA                        | GT               | AC               | ATCGCCTCTTAGGGG            | -                  | ---                        | ...                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | -----ACATCAAGTCTAGT      | ... |  |  |
| ▶ 13           | → | ... TA           | TTA                        | GT               | AC               | TCTTC                      | ---                | -                          | ---                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | -----CATCGGCTCTAGT       | ... |  |  |
| ▶ 14           | → | ... TA           | TTA                        | GT               | AC               | TGACCCCTCCC                | ---                | -                          | ---                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | -----GAAACATCAAGTCTAGT   | ... |  |  |
| ▶ 15           | → | ... TA           | TTA                        | GT               | CACCCC           | --                         | ---                | -                          | ---                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | -----TCTAGT              | ... |  |  |
| ▶ 16           | → | ... TA           | TTACCCCTCCCAGG             | --               | --               | ---                        | -                  | ---                        | ---                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | -----CATCAAGTCTAGT       | ... |  |  |
| ▶ 17           | → | ... TACC         | ---                        | --               | --               | ---                        | -                  | ---                        | ---                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | -----AAACATCAAGTCTAGT    | ... |  |  |

Рис. 3. Точки разрыва-соединения гена *IKZF1* у пациентов детского возраста с В-ОЛЛ, имеющих делецию Ex4–7: 4–17 – нуклеотидные последовательности, принадлежащие пациентам 4–17. Область делеции, включая нематричные нуклеотиды, выделена красным цветом, координаты указаны относительно референсной последовательности гена *IKZF1* (NG\_034231.1), обозначенной как Ref. seq.

Fig. 3. Breakpoints of the *IKZF1* gene in pediatric BCP-ALL patients with Ex4–7 deletion: 4–17 – nucleotide sequences of patients 4–17. The deletion region, including non-matrix nucleotides, is highlighted in red colour, coordinates are given relative to the reference sequence of the *IKZF1* gene (NG\_034231.1) designated Ref. seq.