**Aim:** The results of cancer chemotherapy are not satisfactory enough; that is why a search of pathogenic based personalized approaches is a top priority task of oncology. ER beta creates a new foundation for this. We have revealed high levels and frequency of ER beta in non-small cell lung cancer (NSCLC) and proposed this marker as a target for adjuvant antiestrogen therapy of the disease. In the study we have answered the questions 1) if this approach is appropriate for metastatic lung cancer and 2) could the comparison of ER beta expression in primary and metastatic lung cancer support a good prognostic value of the marker?

**Methods:** 83 surgical specimens of NSCLC and lung metastasis were analyzed by flowcytometry after incubation with primary (clone 14C8, ab288, Abcam) and secondary (F2772, Sigma) antibodies. Mean cell fluorescence and number of stained cells were analyzed with WinMDI software and Kolmogorov-Smirnov approach. Three level of ER beta were analyzed: high – ER was revealed in more than i50% of the cells; moderate – in 30-49%; low – in less than 30%.

**Results:**
1. ER beta was revealed in most of the primary (92%) and metastatic (86%) tumors with lower mean level of expression in metastasis (42% and 34%, \( p = 0.03 \)) and with no differences in mean ER beta intensity (\( p = 0.06 \)). 2. High ER beta level was revealed in 35% of NSCLC, but in metastases – in 14 % (\( p = 0.03 \)). 3. The cases with moderate plus low ER beta level were revealed in 65% of NSCLC, but in metastases the index was higher – 86% (\( p = 0.03 \)). 4. Number of cases with ER beta level more than 30% (moderate plus high level) was similar in NSCLC and metastasis (73 vs. 65%, \( p = 0.08 \)).

**Conclusions:**
1. Lower indexes of ER beta expression in lung metastases cells with high metastatic potential compared with primary lung tumors confirm the good prognostic value of ER beta in NSCLC. 2. More than half of lung metastasis patients, as well as about 70% of patients with NSCLC with high and moderate level of ER beta expression, could benefit from adjuvant antiestrogen therapy. Supported by RFBR grants (13-04-01004-a, 15-04-06991-a, 14-04-31734–mol-a), FIMT-2014-205 and scholarship of the President of Russian Federation (376.2012.4).

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