Biomarkers and therapeutic interventions in lung cancer - Personalized medicine in Oncology

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15th of May 2024

Regional Meeting
Human Genomics for Health: Enhancing the Impact of Effective Research
**Past, present and future**

<table>
<thead>
<tr>
<th>Today (2013)</th>
<th>Targets today</th>
<th>Targets in the future</th>
</tr>
</thead>
<tbody>
<tr>
<td>EGFR</td>
<td>ALK</td>
<td>ROS1</td>
</tr>
</tbody>
</table>

2008
- Adenocarcinoma
- Large-cell carcinoma
- Squamous cell carcinoma

2000
- Non-small-cell lung cancer
- Small-cell lung cancer

1990
- Lung cancer

Adenocarcinoma and treatable oncogenic alterations with approved drugs (EGFR mutation and ALK translocation)
- Large-cell carcinoma
- Small-cell lung cancer
- Squamous cell carcinoma without oncogenic alteration
- Squamous cell carcinoma with oncogenic alteration

*Lancet. 2013 24;382(9893):709-19*
EGFR

México (34.3%)
N 1.417/EGFR+ 486

Costa Rica (31.4%)
N 102/EGFR+ 32

Colombia (24.7%)
N 1.939/EGFR+ 479

Perú (51%)
N 300/EGFR+ 200

Panama (27.3%)
N 174/EGFR+ 48

Argentina (14.4%)
N 1.713/EGFR+ 247

Latin America (26%)  
N 5.738/EGFR+ 1.492

Ancestries
### EGFR

#### Figure 2A

<table>
<thead>
<tr>
<th>Department</th>
<th>Sample number(%)</th>
<th>% (LBCI - UBCI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Magdalena</td>
<td>37 (0.7%)</td>
<td>16.2% (4.3% - 28.1%)</td>
</tr>
<tr>
<td>Atlántico</td>
<td>281 (5.6%)</td>
<td>21.0% (16.2% - 25.8%)</td>
</tr>
<tr>
<td>Casará</td>
<td>57 (1.1%)</td>
<td>14.0% (5.0% - 23.1%)</td>
</tr>
<tr>
<td>Bolívar</td>
<td>137 (2.7%)</td>
<td>20.4% (13.7% - 27.2%)</td>
</tr>
<tr>
<td>Córdoba</td>
<td>165 (3.3%)</td>
<td>20.0% (13.9% - 26.1%)</td>
</tr>
<tr>
<td>Norte de Santander</td>
<td>101 (2.0%)</td>
<td>26.7% (18.1% - 35.4%)</td>
</tr>
<tr>
<td>Antioquia</td>
<td>1363 (27.1%)</td>
<td>16.2% (14.3% - 18.2%)</td>
</tr>
<tr>
<td>Santander</td>
<td>354 (7.0%)</td>
<td>24.0% (19.6% - 28.5%)</td>
</tr>
<tr>
<td>Boyacá</td>
<td>47 (0.9%)</td>
<td>36.2% (22.4% - 49.9%)</td>
</tr>
<tr>
<td>Cundinamarca</td>
<td>70 (1.4%)</td>
<td>22.9% (13.0% - 32.7%)</td>
</tr>
<tr>
<td>Caldas</td>
<td>86 (1.7%)</td>
<td>17.4% (9.4% - 25.5%)</td>
</tr>
<tr>
<td>Risaralda</td>
<td>128 (2.5%)</td>
<td>18.0% (11.3% - 24.8%)</td>
</tr>
<tr>
<td>Quindío</td>
<td>92 (1.8%)</td>
<td>20.7% (12.4% - 28.9%)</td>
</tr>
<tr>
<td>Tolima</td>
<td>88 (1.7%)</td>
<td>22.7% (14.0% - 31.5%)</td>
</tr>
<tr>
<td>Meta</td>
<td>43 (0.9%)</td>
<td>25.6% (12.5% - 38.6%)</td>
</tr>
<tr>
<td>Huila</td>
<td>98 (1.9%)</td>
<td>22.4% (14.2% - 30.7%)</td>
</tr>
<tr>
<td>Valle del Cauca</td>
<td>196 (3.9%)</td>
<td>26.5% (20.3% - 32.7%)</td>
</tr>
<tr>
<td>Bogotá</td>
<td>1695 (33.6%)</td>
<td>25.1% (23.0% - 27.1%)</td>
</tr>
</tbody>
</table>

Total: 5038 (100%)

21.5% (20.4% - 22.6%)
EGFR

L858R Exon 19 Deletion

14,0-18%
18,1-22%
22,1-26%
26,1-30%
30,1-34%
34,1-38%
Ancestries and beyond
Ancestries and beyond

A

![Graph of EGFR and KRAS mutation percentages against NAT ancestry percentage.](image)

B

**All samples**

- **NAT ancestry %**
  - BRAF-mutant
  - EGFR-mutant
  - KRAS-mutant
  - ALK-mutant

**Smoking signature %**

- BRAF-mutant
- EGFR-mutant
- KRAS-mutant
- ALK-mutant

**Non-smokers**

- **NAT ancestry %**
  - BRAF-mutant
  - EGFR-mutant
  - KRAS-mutant
  - ALK-mutant

**Smoking signature %**

- BRAF-mutant
- EGFR-mutant
- KRAS-mutant
- ALK-mutant

*Note: The graphs show the relationship between genetic mutations and smoking signatures across different ancestry percentages. The logistic regression coefficients indicate the strength of the relationship.*
Thank you