Background: Activated circulating endothelial cells (aCECs) have been indicated as a potential biomarker for cancerous angiogenesis in varieties of malignancies. Furthermore, several studies have exhibited aCECs were related with progression-free survival (PFS) and overall survival (OS) in anti-angiogenesis therapy. Anlotinib is a TKI of VEGFR1/2/3, FGFR1-4, PDGFR α/β, and c-Kit. As a third-line and above treatment on advanced NSCLC, Anlotinib has shown an affirmatory efficacy in ALTER0303 controlled trial. Herein we investigated the connection between aCECs and PFS, OS and metastases burden in the trial. **Method:** Blood samples were collected at baseline (pre-therapeutically), the 7th, 15th, 21th, 42nd, 63rd day of Anlotinib or placebo. aCECs was measured by Flow Cytometry. Receiver-operating characteristics (ROC) analysis was used to determine a cutoff value of baseline aCECs counts to divide them into high and low groups. The predicting value of aCECs for PFS was investigated by univariate survival analysis. Chi-square test for baseline aCECs counts and patients' clinical characteristics before Anlotinib or placebo treatment was performed. **Result:** aCECs were obtained in 78 patients (Anlotinib n=49). No significant difference in baseline characteristics was found between two arms ($P>0.05$). High baseline aCECs count was statistically in connection with more metastatic lesions (>3) ($c^2= 4.905$,$P=0.027$). 49 Anlotinib treated patients were divided into 35 and 14 according to the ratio of minimal aCECs counts at every time point and baseline (aCECs min/baseline), as <1 and ≥1. Median follow-up was 8.6 months. Patients with min/baseline<1 had longer median PFS than ones with min/baseline>1 (193 vs.124 days, HR=0.439, 95%CI 0.211-0.912, $P=0.023$. shown in Table1). However, no significant relation between PFS and aCECs min/baseline was found in control arm. **Conclusion:** Decreased aCECs during an initial period of Anlotinib therapy may predict longer PFS and baseline aCECs count may be related with the number of metastatic lesions. **Keywords:** aCECs, Anlotinib, ALTER0303

Table 1. Comparison of Progression Rate in Various aCECs min/baseline

	N	Progression Rate % 3 months	6 months	9 months	Log Rank $\chi2$	*P*-value
aCECs min/baseline≥1	14	36.5	52.4	84.1	5.149	0.023
aCECs min/baseline<1	35	20.4	26.7	47.3		

P3.01-085
A Phase 2 Trial of Apatinib in Advanced Non-Squamous NSCLC: Updated Data and Clinical Benefit of Continuing Apatinib after Initial Progression

F. Wu, S. Zhang, J. Yu, G. Gao, W. Li, W. Cai, C. Su, X. Chen, S. Ren, C. Zhou *Medical Oncology, Shanghai Pulmonary Hospital, Tongji University, Shanghai/CN*

Background: Apatinib exerts anti-tumor effects by selectively inhibiting VEGFR-2. A single-arm Phase 2 study of apatinib monotherapy in advanced non-squamous NSCLC patients showed promising response across multiple therapy lines (P3.02C-025, WCLC 2016 Abstracts). Here we report the updated efficacy and safety data, as well as the clinical benefit of continuing apatinib beyond initial progression. **Method:** Forty patients with previously heavily treated advanced non-squamous NSCLC were enrolled to receive apatinib until progression, unacceptable toxicity, withdrawal or death. After study discontinuation, apatinib monotherapy or combined therapy was allowed for patients on disease progression at the discretion of the investigators and under the consent of patients. **Result:** The cutoff date was March 12, 2017. The treatment duration of apatinib was 82 (43, 127) days with a mean dosage of 477.0 ± 85.3 mg/day. Thirty-eight patients were available for tumor response evaluation, and the best overall response rate (ORR) and disease control rate (DCR) were 21.1% and 76.3%, respectively. The median progression-free (PFS) and overall survival (OS) were 3.32 (95% CI, 2.37−4.86) and 9.26 (95% CI, 5.36−not estimable) months, respectively. Common adverse events (AEs) were hand-foot-skin reaction (HFSR) (30.0%), proteinuria (27.5%), hypertension (17.5%) and aphthous stomatitis (22.5%). Severe AEs included Grade 3 HFSR (5%), hypertension (5%) and thrombocytopenia (5%). Results of preliminary subgroup analyze indicated that age, gender, PS score, treatment line and having a driver gene mutation had no significant effects on ORR, DCR and survival. After initial progression following apatinib treatment, 9 patients received apatinib alone or combined therapy with docetaxel, gefitinib or erlotinib (Table). One PR and 6 SD were achieved. Encouragingly, 8 patients had treatment duration over 4 months. **Conclusion:** This updated analysis further confirmed the efficacy and safety of apatinib for heavily treated advanced non-squamous NSCLC. Continuing apatinib monotherapy or combined therapy could bring clinical benefit. **Keywords:** non-small cell lung cancer, Apatinib, Treatment beyond disease progression

Table. Patients continued apatinib alone or combined therapy after progression

No.	Regimens after progression	Dose of apatinib (mg)	Best efficacy	Treatment duration (months)	Reason for discontinue treatment
1	Apatinib plus Docetaxel	500	PR	13.11	Second progression
2	Apatinib plus Gefitinib	250	SD	7.98	Lost to follow-up
3	Apatinib plus Gefitinib	375	SD	7.82	Death
4	Apatinib plus Gefitinib	500	SD	5.82	Lost to follow-up
5	Apatinib plus Erlotinib	500	SD	4.27	Lost to follow-up
6	Apatinib	375	SD	5.13	Second progression
7	Apatinib	500	NE	4.44	Second progression
8	Apatinib	250	SD	4.24	Death
9	Apatinib	500	NE	0.33	Death

P3.01-086
Biomarker Testing Trends and Treatment Patterns in Advanced Non-Small Cell Lung Cancer (NSCLC) Patients in the United States

L. Chu,[1] F. Corvino,[2] J. Yi,[2] M. Zivkovic,[2] W. Wong[1] *[1]Genentech, South San Francisco/US, [2]Genesis Research, Hoboken, NJ/US*

Background: The CAP/IASLC/AMP molecular testing guidelines recommend ALK and EGFR testing on patients with lung adenocarcinoma, regardless of clinical characteristics. While PD-L1 testing has recently become available, a potential challenge to implement this testing is limited tissue availability. NGS may address this issue but there are limited published data assessing the impact of PD-L1 testing on NSCLC biomarker testing and treatment patterns using large real-world data sources. The objective of this study is to describe real-world biomarker testing and treatment patterns in the United States (US). **Method:** Flatiron Health's database is a longitudinal, demographically and geographically diverse database containing EHR data. The database includes over 265 cancer clinics (~800 sites of care) representing

more than 1.7 million active US cancer patients. Patients with ≥2 visits after Jan 1, 2011, ≥18 years of age, treated in first line (1L), and stage IIIB/IV NSCLC diagnosis from Jan 2012 - Mar 2017 were included in this analysis. Results were stratified by year of diagnosis (2012-2015 vs. 2016+). **Result:** Of 21,514 patients identified, the majority (80%) were diagnosed with de novo disease and 76% presented with non-squamous histology. PD-L1 testing rates were higher in those diagnosed in 2016+ compared to 2012-2015 (36% vs. 7%). A larger proportion of patients were tested for at least one biomarker in 2016+ (75%) vs. 2012-2015 (65%). The use of NGS also doubled (10% in 2012-2015 vs. 21% in 2016+) during this time period. For all patients, biomarker positivity rates varied by biomarker (PD-L1: 34%, EGFR: 17%, ALK: 4%, ROS1: 2%, KRAS: 30%) and by histology with the exception of PD-L1. The percentage of patients who initiated 1L systemic therapy, prior to receiving their first positive biomarker test results, ranged from 17% to 27% depending on the biomarker test. **Conclusion:** The introduction of PD-L1 testing has coincided with an increase in the proportion of patients being tested for a biomarker, as well as an increase in NGS. NGS has previously been shown to be associated with the longest turn-around time, and up to 27% of patients initiate systemic therapy prior to receiving positive biomarker test results. Additional research to understand the resource implications and clinical outcomes of initiating systemic therapy prior to test results (rather than delaying therapy) is underway. **Keywords:** non-small cell lung cancer, Real world, biomarker testing

P3.01-087
Impact Factor Analysis for Efficacy and Prognosis of Anlotinib in NSCLC as Third-Line Treatment: Data from Trial ALTER 0303

K. Li,[1] J. Wang,[1] B. Han,[2] Y. Zhao,[3] Q. Wang,[4] L. Zhang,[5] J. Shi,[6] Z. Wang,[7] J. He,[8] Y. Shi,[9] Y. Cheng,[10] W. Chen,[11] X. Wang,[12] Y. Luo,[13] K. Nan,[14] F. Jin,[15] J. Dong,[16] B. Li,[17] Y. Chen,[18] J. Zhou,[19] D. Wang,[20] X. Zhou,[21] Y. Yu,[22] L. Chen,[23] A. Liu,[24] J. Huang,[25] C. Huang,[26] B. Cao,[27] J. Chen,[28] R. Ma,[29] Z. Yu,[30] C. Ding,[31] H. Wang[32]

[1]Tianjin Medical University Cancer Institute and Hospital, Tianjin, China, Tianjin/CN, [2]Shanghai Chest Hospital, Shanghai Jiaotong University, Shanghai/CN, [3]Shanghai Chest Hospital, Shanghai Jiao Tong University, Shanghai/CN, [4]Department of Internal Medicine, Affiliated Cancer Hospital of Zhengzhou University, Henan Cancer Hospital, Zhengzhou/CN, [5]Peking Union Medical College Hospital, Beijing/CN, [6]Linyi City Tumor Hospital, Linyi/CN, [7]Shandong Province Tumor Hospital, Jinan/CN, [8]Department of Thoracic Surgery, Guangzhou Medical University First Affiliated Hospital, Guangzhou 510120, China, Guangzhou/CN, [9]Department of Medical Oncology, Cancer Institute and Hospital, Chinese Academy of Medical Sciences and Peking Union Medical College, Beijing Key Laboratory of Clinical Study on Anticancer Molecular Targeted Drugs, Beijing/CN, [10]Thoracic Oncology, Jilin Provincial Cancer Hospital, Changchun/CN, [11]Lanzhou Military General Hospital, Lanzhou/CN, [12]Qilu Hospital of Shandong University, Jinan/CN, [13]Hunan Province Tumor Hospital, Changsha/CN, [14]First Affiliated Hospital of Xi'An Jiaotong University, Xian/CN, [15]Tangdu Hospital, Fourth Military Medical University, Xian/CN, [16]Yunnan Cancer Hospital, Kunming/CN, [17]Beijing Chest Hospital, Capital Medical University, Beijing/CN, [18]Jiangxi Cancer Hospital, Nanchang/CN, [19]Respiratory Diseases, The First Affiliated Hospital, College of Medicine, Zhejiang University, Hangzhou/CN, [20]Chongqing Cancer Hospital, Chongqing/CN, [21]Affiliated Cancer Hospital of Xinjiang Medical University, Wulumuqi/CN, [22]Harbin Medical University Cancer Hospital, Haerbin/CN, [23]The First Affiliated Hospital of Shantou University Medical College, Shantou/CN, [24]The Second Affiliated Hospital of Nanchang University, Nanchang/CN, [25]The Second Affiliated Hospital of Zhejiang University, Hangzhou/CN, [26]Fujian Provicial Cancer Hospital, Fuzhou/CN, [27]Beijing Friendship Hospital, Capital Medical University, Beijing/CN, [28]Tianjin Medical University General Hospital, Tianjin/CN, [29]Thoracic Oncology, Liaoning Cancer Hospital, Shenyang/CN, [30]The Affiliated Hospital of Qingdao University, Qingdao/CN, [31]Fourth Hospital of Hebei Medical University, Shijiazhuang/CN, [32]The Affiliated Hospital of Xuzhou Medical University, Xuzhou/CN

Background: Anlotinib hydrochloride is a novel TKI targeting the VEGFR, FGFR, PDGFR and c-Kit. With the capability of inhibiting the tumor angiogenesis and tumor cell itself, anlotinib had showed significantly improvement in OS (9.63 vs. 6.30 months, HR=0.68, 95%CI 0.54-0.87, p=0.0018) and PFS (5.37 vs. 1.40 months, HR=0.26, 95%CI 0.21-0.33, p<0.0001) in ALTER 0303 study for refractory cancer, a randomized, double-blind, placebo-controlled Phase III trial in China. Here, we report the main impact factors affecting the efficacy and prognosis of anlotinib based on the data from ALTER0303 to elucidate the most benefit population. **Method:** Analyzed data were collected from 294 patients that were enrolled in ALTER0303 trial and received anlotinib treatment between 4th March 2015 and 15th August 2016. The statistical analysis was conducted using SPSS19.0 software, in which the measuring and enumeration materials were described with Mean±SD and frequency/percentage respectively, Kaplan-Meier method was used for survival curves in survival analysis. Independent impact factors of OS and PFS were identified by univariate and multivariate analysis in Cox proportional hazards regression model (Significant level, α=0.05). **Result:** Several factors were discovered to be associated with the efficacy of Anlotinib treatment. The impact factors were presented in Table 1. **Conclusion:** This analysis explored the possible impact factors of PFS and OS in Anlotinib treatment. Moreover, we provide real data for the prediction of Anlotinib efficacy and most benefit population through the baseline characteristics and variety of clinical index. However, further analysis in the larger scale study is still looking forward. **Keywords:** NSCLC, Anlotinib, third-line treatment

Table 1. Impact factors for PFS and OS analyzed by Cox proportional hazards regression model

	Independent risk factor	Independent protective factor
PFS	Ratio of granulocytes to lymphocytes at PD (HR=1.07, 95%CI 1.041-1.100, p<0.0001) Elevated ALP level (HR=1.553, 95%CI 1.142-2.112, p=0.005) Baseline sum of longest diameters of target lesions (HR=1.004, 95%CI 1.001-1.006, p=0.007)	Elevated TSH level (HR= 0.555, 95%CI 0.422-0.730, p<0.0001) Hypercholesteremia (HR=0.720, 95%CI 0.534-0.971, p=0.031) Hypertension (HR=0.482, 95%CI 0.370-0.628, p<0.0001) Hand-foot skin reaction (HR=0.489, 95%CI 0.373- 0.643, p<0.0001) Elevated LDL level (HR=0.630, 95%CI 0.437-0.909, p=0.014) Age (HR=0.987, 95%CI 0.975-0.999, p=0.039)
OS	Ratio of granulocytes to lymphocytes at PD (HR=1.116, 95%CI 1.081-1.151, p<0.0001) Baseline sum of longest diameters of target lesions (HR=1.006, 95%CI 1.003-1.008, p<0.0001) ECOG PS≥2 at PD (HR=2.245, 95%CI 1.704- 3.508, p<0.0001)	Elevated TSH level (HR=0.725, 95%CI 0.524- 1.005, p=0.053) Hypertriglyceridemia (HR=0.601, 95%CI 0.440-0.821, p<0.0001) Rash (HR=0.581, 95%CI 0.369-0.916, p=0.019) Female (HR=0.713, 95%CI 0.533-0.953, p=0.022)