Final Analysis of Fixed-Duration Ibrutinib + Venetoclax for Chronic Lymphocytic Leukemia/ Small Lymphocytic Lymphoma in the Phase 2 CAPTIVATE Study

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FD Ibrutinib + Venetoclax Is Effective as First-Line Treatment for CLL/SLL, Including in Patients With High-Risk Genomic Features

- First-line, all-oral, once-daily ibrutinib + venetoclax for CLL/SLL was investigated in 2 cohorts of the phase 2 CAPTIVATE study: MRD–guided randomized discontinuation (MRD cohort) and FD cohort^{1,2}
- At the previous analysis with up to 5.5 years of follow-up, FD Cohort treatment with ibrutinib + venetoclax demonstrated sustained PFS at the 5-year landmark time, including in patients with high-risk genomic features³
- Here, we report Final Analysis results for patients treated with FD ibrutinib + venetoclax in the FD cohort and in the MRD cohort placebo arm with up to 7 years of follow-up (median 5.75 years)



CLL, chronic lymphocytic leukemia; FD, fixed-duration; MRD, minimal residual disease; PFS, progression-free survival; SLL, small lymphocytic lymphoma. 1. Wierda WG et al. *J Clin Oncol.* 2021;39:3853–3865.. 2. Tam CS et al. *Blood.* 2022;139:3278–3289. 3. Wierda WG et al. *J Clin Oncol.* 2024;42(Suppl 16):7009.

CAPTIVATE Study Design: FD Cohort and MRD Cohort Placebo Arm



- Patients aged ≤70 years with previously untreated CLL/SLL received 3 cycles of ibrutinib, then 12 cycles of ibrutinib + venetoclax (ibrutinib, 420 mg/day orally; venetoclax, 5-week ramp up to 400 mg/day orally)
 - Patients in the FD cohort received no further treatment (n=159)
 - Patients in the MRD cohort placebo arm with confirmed uMRD4 (n=43) received 1 additional cycle of ibrutinib + venetoclax during the MRD-guided randomization, then placebo treatment
- In patients with confirmed PD, on-study retreatment included single-agent ibrutinib
 - FD cohort patients with PD occurring >2 years after EOT could be retreated with FD ibrutinib + venetoclax



^aPatients with confirmed uMRD4 (defined as uMRD <10⁻⁴ by 8-color flow cytometry serially over \geq 3 cycles in both peripheral blood and bone marrow) after 12 cycles of ibrutinib + venetoclax were randomly assigned 1:1 to receive placebo or ibrutinib; the placebo arm was included in the current analysis. EOT, end of treatment; PD, progressive disease; uMRD, undetectable minimal residual disease.

Baseline Characteristics in Patients Treated With FD Ibrutinib + Venetoclax

Characteristic	Total Pooled Population (N=202)	FD Cohort Only (N=159)
Median age (range), years	60.0 (33–71)	60.0 (33–71)
Male, n (%)	131 (65)	106 (67)
Rai stage III/IV, n (%)	59 (29)	44 (28)
High-risk genomic features, n (%) uIGHV del(17p)/TP53 $del(11q)^{a}$ $CK (\geq 3 abnormalities)^{b}$ $CK (\geq 5 abnormalities)^{b}$	119 (59) 29 (14) 36 (18) 35 (17) 19 (9)	89 (56) 27 (17) 28 (18) 31 (20) 16 (10)
Bulky LN disease, n (%) ≥5 cm ≥10 cm	66 (33) 6 (3)	48 (30) 5 (3)

- In total, 202 patients completed FD ibrutinib + venetoclax (FD cohort, n=159; MRD cohort placebo arm, n=43)
- High-risk genomic features at baseline were similar in FD Cohort and the Total Pooled Population and enriched relative to 1L populations with CLL/SLL
- At final analysis, median follow-up was:
 - Total Pooled Population- 68.9 months (range, 0.8–83.9)
 - FD Cohort only- 69.0 months (range, 0.8–73.2)



^aWithout del(17p) per Döhner hierarchy. ^bBy conventional CpG-stimulated cytogenetics; CK status was missing for 30 patients (15%). CK, complex karyotype; LN, lymph node; uIGHV, unmutated IGHV.

Overall Median PFS and OS Were Not Reached With Up to 7 Years of Follow-up (Total Pooled Population)



 Assessed in FD cohort patients only, 5.5-year PFS and OS rates were 60% (95% CI, 52–68) and 96% (95% CI, 91–98), respectively^a

Impact of del(17p)/mutated *TP53* and IGHV Status On Long-Term PFS (Total Pooled Population)



^aSee Supplementary Information for details. mIGHV, mutated IGHV.

MRD Status in Peripheral Blood at EOT^a Is More Strongly Predictive For Long-Term PFS Than MRD Status at C7^b (FD Cohort Patients)



 Assessed in FD cohort patients only, uMRD4 rates in peripheral blood increased from 51% of patients at C7 to 60% at EOT: uMRD4 rate in bone marrow was 60% at EOT^c



^a3 cycles after the 15-cycle fixed-duration ibrutinib + venetoclax treatment, i.e, day 1 of C19 for the FD cohort. ^bAfter 3 cycles of ibrutinib and 3 cycles of ibrutinib + venetoclax. ^cSee Supplementary Information for details. C7, cycle 7; EOT, end of treatment.

MRD Status at EOT Is Predictive of Long-Term PFS Regardless of del(17p)/TP53 Status (FD Cohort Patients)



 Increases in peripheral blood uMRD4 rates from C7 to EOT were particularly notable in patients with del(17p)/mutated TP53 or CK5, and in patients with uIGHV to a lesser extent^a

^aSee Supplementary Information for details. NE, not estimable.

MRD Status at EOT Is Predictive of Long-Term PFS Regardless of IGHV Status and Also Predictive at C7 in Patients With mIGHV (FD Cohort Patients Without del(17p/TP53)



No Resistance-Associated Mutations Were Identified at PD

- In the total pooled population (FD and MRD-placebo cohorts) with a median follow-up of more than 5.5 years, 64/202 patients (32%) had PD after FD ibrutinib + venetoclax treatment
- No patients had resistance-associated mutations in BTK or PLCG2 at PD among 53 patients with available samples
- Two patients were found with a subclonal *BCL2 A113G* mutation of unclear significance at PD: variant allele frequencies were only 8% and 9.3%, respectively
 - Patient 1: Achieved partial response with FD ibrutinib + venetoclax retreatment (complete response was not confirmed due to missing bone marrow assessment).
 - BCL2 A113G mutation was not detectable at the time of eventual relapse after retreatment^a
 - Patient 2: Did not receive retreatment in the study



Patients Who Initiated Ibrutinib-Based Retreatment: Study Baseline Characteristics and Safety during Retreatment

- 73% of patients remained free from next-line treatment at the 5.5-year landmark time point (95% CI, 66–79)
- In total, 36 patients (who met iwCLL criteria for treatment) initiated retreatment with either single-agent ibrutinib (n=25) or FD ibrutinib + venetoclax (n=11)
- No new safety signals were observed during retreatment, relative to the safety profile of 1L treatment with single agent ibrutinib or FD ibrutinib + venetoclax^a
- Across the entire study period, including any retreatment received on study, secondary malignancies occurred in 24 patients: nonmelanoma skin cancers occurred in 16 patients, and other cancers in 14 patients^a

Patients Who Initiated Ibrutinib-Based Retreatment: Study Baseline Characteristics

Characteristic	Single- agent ibrutinib n=25	FD ibrutinib + venetoclax n=11	All retreated patients n=36
Median age (range), years	56.0 (39–71)	63.0 (49–69)	58.5 (39–71)
Male, n (%)	16 (64)	8 (73)	24 (67)
Rai stage III/IV, n (%)	4 (16)	2 (18)	6 (17)
High-risk genomic features, n (%) u GHV del(17p)/TP53 $del(11q)^{b}$ $CK (\geq 3 abnormalities)^{c}$ $CK (\geq 5 abnormalities)^{c}$	20 (80) 4 (16) 7 (28) 8 (32) 5 (20)	8 (73) 6 (55) 1 (9) 3 (27) 2 (18)	28 (78) 10 (28) 8 (22) 11 (31) 7 (19)
Bulky LN disease, n (%) ≥5 cm ≥10 cm	9 (36) 1 (4)	2 (18) 1 (9)	11 (31) 2 (6)



^aSee Supplementary Information for additional details. ^bWithout del(17p) per Döhner hierarchy. ^cBy conventional CpG-stimulated cytogenetics.

Ibrutinib-Based Retreatment Confers Promising Overall Response Rates, PFS, and OS in Patients Needing Subsequent Treatment





^aOf the 6 non-responders, 4 patients achieved SD with reintroduced treatment duration ranging from 6.2–19.4 months; 1 patient was discontinued after reassessment of the putative progressive lesion as not PD, and 1 patient was diagnosed with Richter's Transformation after 1.1 month on retreatment. ^bOf the 2 non-responders, both achieved SD with reintroduced treatment duration of 9.9 and 25.9 months, respectively.

CR, complete response; nPR, nodular partial response; PR, partial response.

Ibrutinib + venetoclax is an all-oral, once-daily, chemotherapy-free FD regimen for first-line treatment of CLL/SLL

With long-term follow-up, durable PFS and OS is observed with ibrutinib + venetoclax treatment, including in patients with high-risk genomic features

uMRD at end of treatment is strongly associated with long-term PFS overall irrespective of high-risk genomic features

Ibrutinib-based retreatment provides durable responses in patients needing subsequent therapy after completion of FD ibrutinib + venetoclax

Together with the GLOW study, CAPTIVATE led to the availability of the ibrutinib + venetoclax fixed-duration regimen across 78 countries; we thank the patients whose participation made this possible.



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Supplementary Information

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FD, fixed duration; OS, overall survival; PFS, progression-free survival.

Time to Next Treatment in the Total Pooled Population and FD Cohort Only



NLT, next-line treatment; TTNT, time to next treatment.

Impact of del(17p)/mutated *TP53* and IGHV Status On Long-Term PFS (FD Cohort)



C7, cycle 7; CK, complex karyotype; FD, fixed-duration; PFS, progression-free survival; uIGHV, unmutated IGHV.

MRD Rates in FD Cohort Patients With and Without High-Risk Genomic Features

Forest Plot of uMRD4 Rates in Peripheral Blood at C7^a According to High-Risk Genomic Features at Baseline (FD Cohort Patients) Forest Plot of uMRD4 Rates in Peripheral Blood at EOT^a According to High-Risk Genomic Features at Baseline (FD Cohort Patients)



^aIn evaluable patients with non-missing MRD results.

C7, cycle 7; CK, complex karyotype; FD, fixed-duration; uMRD4, undetectable minimal residual disease (<10⁻⁴).

MRD Status at EOT Is Predictive of Long-Term PFS in Patients With and Without High-Risk Genomic Features^a and Also Predictive at C7 in Patients Without High-Risk Genomic Features (Including CK3)^a (FD Cohort)



^auIGHV, del(17p), mutated *TP53*, and/or CK (defined as ≥3 abnormalities).

C7, cycle 7; CK, complex karyotype; EOT, end of treatment; FD, fixed-duration; PFS, progression-free survival; uMRD4, undetectable minimal residual disease (<10⁻⁴).

MRD Status at EOT Is Predictive of Long-Term PFS in Patients With and Without High-Risk Genomic Features^a and Also Predictive at C7 in Patients Without High-Risk Genomic Features (Including CK5)^a (FD Cohort)



^auIGHV, del(17p), mutated *TP53*, and/or CK (defined as ≥5 abnormalities).

C7, cycle 7; CK, complex karyotype; EOT, end of treatment; FD, fixed-duration; PFS, progression-free survival; uMRD4, undetectable minimal residual disease (<10⁻⁴).

Long-Term PFS in Patients With uIGHV and mIGHV, With or Without One or More: del(17p), Mutated *TP53*, and CK3^a (Total Pooled Population and FD Cohort)



Safety of Ibrutinib-Based Retreatment Shows No New Safety Signals

TEAEs,ª n (%)	Single-agent ibrutinib n=25	FD ibrutinib + venetoclax n=11
Any AE	22 (88)	11 (100)
Most frequent AEs ^b COVID-19 Diarrhea Hypertension	6 (24) 5 (20) 5 (20)	2 (18) 4 (36) 5 (45)
Grade 3 or 4 AEs	, M ^{oor} 9 (36)	4 (36)
AEs leading to discontinuation	્ર ^{ક્રુડ} 1 (4)	0
AEs leading to dose reduction	50 ¹ 0	0

Second Malignancies Across the Entire Study Period^c

- Across the entire study period, second malignancies occurred in 24 patients:
 - During the TEAE period for FD ibrutinib + venetoclax in 12 patients (8 non-melanoma skin cancers, 6 other cancers)
 - After the initial TEAE period and before retreatment in 9 patients (4 non-melanoma skin cancers, 7 other cancers)
 - During the TEAE period for ibrutinib-based retreatment in 4 patients (4 non-melanoma skin cancers, 1 other cancer)



^aTEAEs were collected until 30 days after the last dose of study treatment or the start of subsequent therapy, whichever occurred first. ^bOccurring in \geq 20% of patients who received single-agent ibrutinib or ibrutinib + venetoclax. ^cSerious AEs considered related to study treatment and second malignancies continued to be collected after completion of the FD treatment-emergent period (up to 30 days after last dose of study treatment or start of subsequent therapy, whichever occurred first).

AE, adverse event; TEAE, treatment-emergent adverse event.