Main inclusion Criteria

1. Disease type: As per 2016 WHO classification, have histologically proven aggressive B-NHL: DLBCL, not otherwise specified (de novo or transformed indolent NHL), high-grade B-cell lymphoma with MYC and BCL2 ± BCL6 rearrangements with diffuse LBCL histology (DHL/THL), PMBCL, T/HRBCL, or FL3b. Availability of tumor tissue for submission to central laboratory is required for study enrollment. Archival tumor tissue for histological assessment prior to enrollment is allowed.
2. primary refractory or relapse ≤ 12 months from initiation of frontline therapy. Treatment at frontline should have included anti-CD20 antibody and anthracycline--containing regimen.
3. Measurable disease
4. Intend to proceed to ASCT
5. Age>18y
6. ECOG 0 of 1
7. Platelets>75x10E9/L (7days from transfusion) – ANC>1x10E9/L – Hb >9 g/dL (5.59 mmol/L). If BM involvement: platelets >25x10E9/L, Hb> 7 g/dL and ANC>0.5x10E9/L
8. Adequate organ function
Cardiac ejection fraction > 50% by echocardiogram or multigated acquisition (MUGA) scan • Total bilirubin ≤ 1.5 x upper limit of normal (ULN) (≤ 3 x ULN if attributed to lymphoma infiltration of liver) • Alanine aminotransferase (ALT) and aspartate aminotransferase (AST) ≤ 3 x ULN (≤ 5 x ULN if attributed to lymphoma infiltration of liver) • Alkaline phosphatase (ALP) ≤ 2.5 x ULN (≤ 5 x ULN if attributed to lymphoma infiltration of liver) • Calculated creatinine clearance by Cockcroft-Gault formula ≥ 50 mL/min • Pulmonary function defined as oxygen saturation > 90% on room air, forced expiratory volume in one second ≥ 50%, and diffusing capacity of the lungs for carbon monoxide (DLCO) ≥ 50%.

Main exclusion criteria

1. Primary CNS lymphoma
2. History of or current relevant CNS pathology
3. Other malignancy (unless adequately treated and cancer free for at least 3y)
4. Prior organ transplantation
5. Active infection
6. Pregnancy-breastfeeding