Supplementary table 2 : Deconvolution methods implemented in the benchmarking pipeline CATD

	Method name	Package/framework	Type	Principle	Category	Repo/website	Reference	Date published
1	Bisque	BisqueRNA R package	supervised	nnls regression	single-cell	https://github.com/cozygene/bisque	Jew, B., Alvarez, M., Rahmani, E. et a	24/04/2020
2	bseqsc	bseqsc R package by githu	supervised	uses CIBERSORT (n-support vector	single-cell	https://github.com/shenorrLab/bseqsc	Baron M, Veres A, Wolock SL, Faust	22/09/2016
3	CDSeq	CDSeq R packages from CRAN/github[1]	unsupervised[2]	probabilistic model	bulk	https://github.com/kkang7/CDSeq_R_Package	Kang K, Meng Q, Shats I, Umbach D	2/12/2019
4	CIBERSORT	CIBERSORT R source code under license[3]	supervised	n-support vector regression	bulk	https://cibersortx.stanford.edu/	Newman AM, Liu CL, Green MR, Ger	30/3/2015
5	CPM	scBio CRAN R-package	supervised	linear SVR (the "LiblinearR" R packag	single-cell	https://github.com/amitfrish/scBio	Frishberg A, Peshes-Yaloz N, Cohn O	18/09/2019
6	DCQ	ComiCs R package from C	supervised	elastic net regularization (gmlet packa	bulk	https://cran.r-project.org/web/packages/ComICS/index.html ,http://dcq.tau.ac.il/	Altboum Z, Steuerman Y, David E, E	25/02/2014
7	momf	omnideconv	supervised	Matrix Factorization		https://github.com/omnideconv/omnideconv	Xifang Sun, Shiquan Sun, and Sheng	2019
8	debCAM_mark	debCAM Bioconductor R pac	semi-supervised	Convex analysis of mixtures	bulk	https://www.bioconductor.org/packages/release/bioc/html/debCAM.html, http://bioconductor.org/packages/release/bioc/vignettes/debCAM/inst/doc/debcam.html#introduction	Wang, Niya, Eric P. Hoffman, Lulu Chen, Li Che	07/01/2016
9	AutogeneS	omnideconv	supervised	feature selection and Nu-SVR,	single-cell	https://github.com/omnideconv/omnideconv	Aliee, Hananeh and Theis, Fabian, AutoG	21/07/2021
10	deconf	CellMix R package	unsupervised	Alternate least-square NMF method, using heuristic co	bulk	http://web.cbio.uct.ac.za/~renaud/CRAN/web/CellMix/index.html ,	Repsilber D, Kern S, Telaar A, Walzl G,	14/01/2010
11	DeconRNASeq	DeconRNASeq Rpackage	supervised	nonnegative decomposition by quadratic pro	bulk	https://bioconductor.org/packages/release/bioc/html/DeconRNASeq.html	Gong, T., et al. (2011) Optimal Deconvolution	16/11/2011
12	DSA	CellMix R package	supervised	linear regression (solve by quandratic pr	bulk	http://web.cbio.uct.ac.za/~renaud/CRAN/web/CellMix/index.html	Zhong, Y., Wan, YW., Pang, K. et al. Dig	07/03/2013
13	dtangle	dtangle package is on CRA	supervised	linear regression	bulk	https://cran.r-project.org/web/packages/dtangle/index.html , https://gjhunt.github.io/dtangle/vign/basic-deconvolution.html	Hunt GJ, Freytag S, Bahlo M, Gagnon-B	01/06/2019
14	DWLS	DWLS R package from githu	supervised	d-wls regression	single-cell	https://github.com/PelzKo/dwls	Tsoucas, D., Dong, R., Chen, H. et al. Ac	05/07/2019
15	elasticnet	glmnet R package from CRA	semi-supervised	elastic net regression	bulk	https://cran.r-project.org/web/packages/glmnet/index.html	Friedman J, Hastie T, Tibshirani R (2010	02/02/2010
16	EPIC	EPIC R package from github	semi-supervised	constrained wls regression	bulk	https://github.com/GfellerLab/EPIC	Racle J, Gfeller D. EPIC: A Tool to Estim	03/03/2020
17	EpiDISH	EpiDISH R package from bio	semi-supervised	robust partial correlations	bulk	https://www.bioconductor.org/packages/release/bioc/html/EpiDISH.html	Zheng SC, Breeze CE, Beck S, Teschen	13/02/2017
18	FARDEEP	FARDEEP R package from C	semi-supervised	least trimmed squares regression	bulk	https://cran.r-project.org/web/packages/FARDEEP/index.html	Hao Y, Yan M, Heath BR, Lei YL, Xie Y. F	06/05/2019
19	lasso	glmnet R package from CRA	semi-supervised	lasso regression	bulk	https://cran.r-project.org/web/packages/glmnet/index.htmll	Friedman J, Hastie T, Tibshirani R (2010	02/02/2010
20	MuSIC	MuSiC R package from githu	supervised	weighted nnls regression	single-cell	https://xuranw.github.io/MuSiC/articles/MuSiC.html	Wang, X., Park, J., Susztak, K. et al. Bul	22/01/2019
21	nnls	nnls R package from CRAN	supervised	nnls regression	bulk	https://cran.r-project.org/web/packages/nnls/index.html	Lawson CL, Hanson RJ (1995). Solving	1995
22	ols	-	supervised	ols regression	bulk	-	Chambers, J., Hastie, T., Pregibon, D	1990
23	proportionsInAc	ADAPTS package	supervised	linear regression	bulk	https://github.com/sdanzige/ADAPTS	Danziger SA, Gibbs DL, Shmulevich I, M	19/11/2019
24	ridge	gmlet package	supervised	generalised linear model ridge	bulk	-	Friedman, J., Hastie, T. & Tibshirani,	2010
25	RLR	MASS	supervised	robust linear regression	bulk	https://github.com/cran/MASS	Ripley, B. et al. MASS: Support Func	2002
26	SCDC	r package github	supervised	feature selection and nnls	single-cell	https://github.com/meichendong/SCDC	Meichen Dong, Aatish Thennavan, Eugene U	01/2021
27	ssFrobenius	CellMix R package	semi-supervised	Semi-supervised NMF algorithm for Euclidean distanc	bulk	http://web.cbio.uct.ac.za/~renaud/CRAN/web/CellMix/index.html ,	Repsilber D, Kern S, Telaar A, Walzl G,	14/01/2010
28	ssKL	CellMix R package	semi-supervised	Semi-supervised NMF algorithm for KL divergence, u	bulk	http://web.cbio.uct.ac.za/~renaud/CRAN/web/CellMix/index.html ,	Repsilber D, Kern S, Telaar A, Walzl G,	14/01/2010
29	TIMER	TIMER web	supervised	supervised	single-cell	http://timer.cistrome.org/	Li T, Fu J, Zeng Z, Cohen D, Li J, Che	02/07/2020

*CDSeq was initial built in MATLAB code and then was implemented in R

**CDSeq utilises an unsupervised learning framework that doesn't need a reference prior to deconvolution, it can use a single-cell reference if that is available in order to annotate the discovered cell types