



Method development for metabolomics

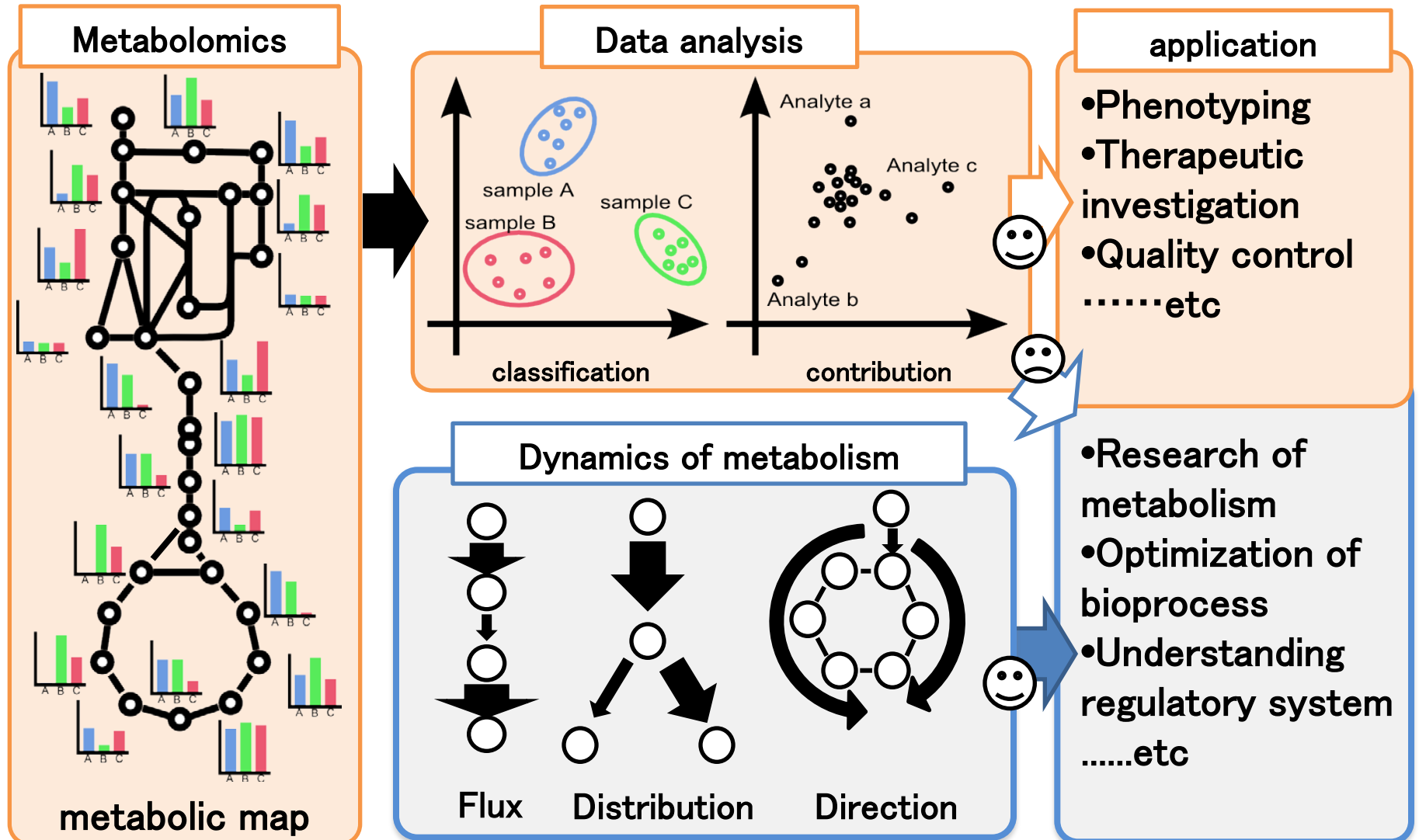


Metabolic Turnover analysis



Metabolic Dynamics Analysis

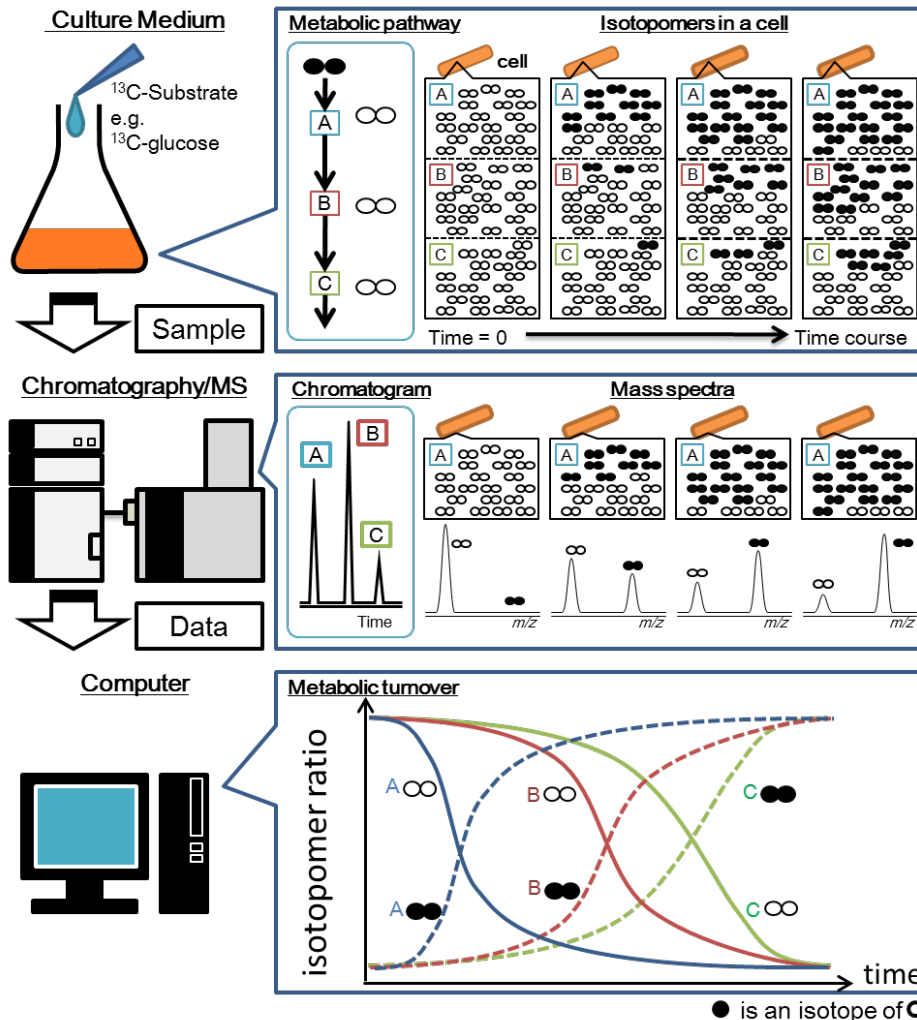
It is not enough to understand metabolism of microorganism with only snapshot analysis
→ Dynamics information of metabolism help to understand it





Metabolic Turnover Analysis

An application of stable-isotope tracers gives us a dynamic information of metabolome data by providing chronological changes in isotope-labeling patterns of intracellular metabolites



- Cell cultivation
- Isotope dilution
- Time course sampling

- Separation of metabolites
- Detection of each isotopomers

- Calculation of isotopomer ratio
- Data analysis
- Estimation of metabolic dynamics



LC/MS-based microbial metabolomics platform development

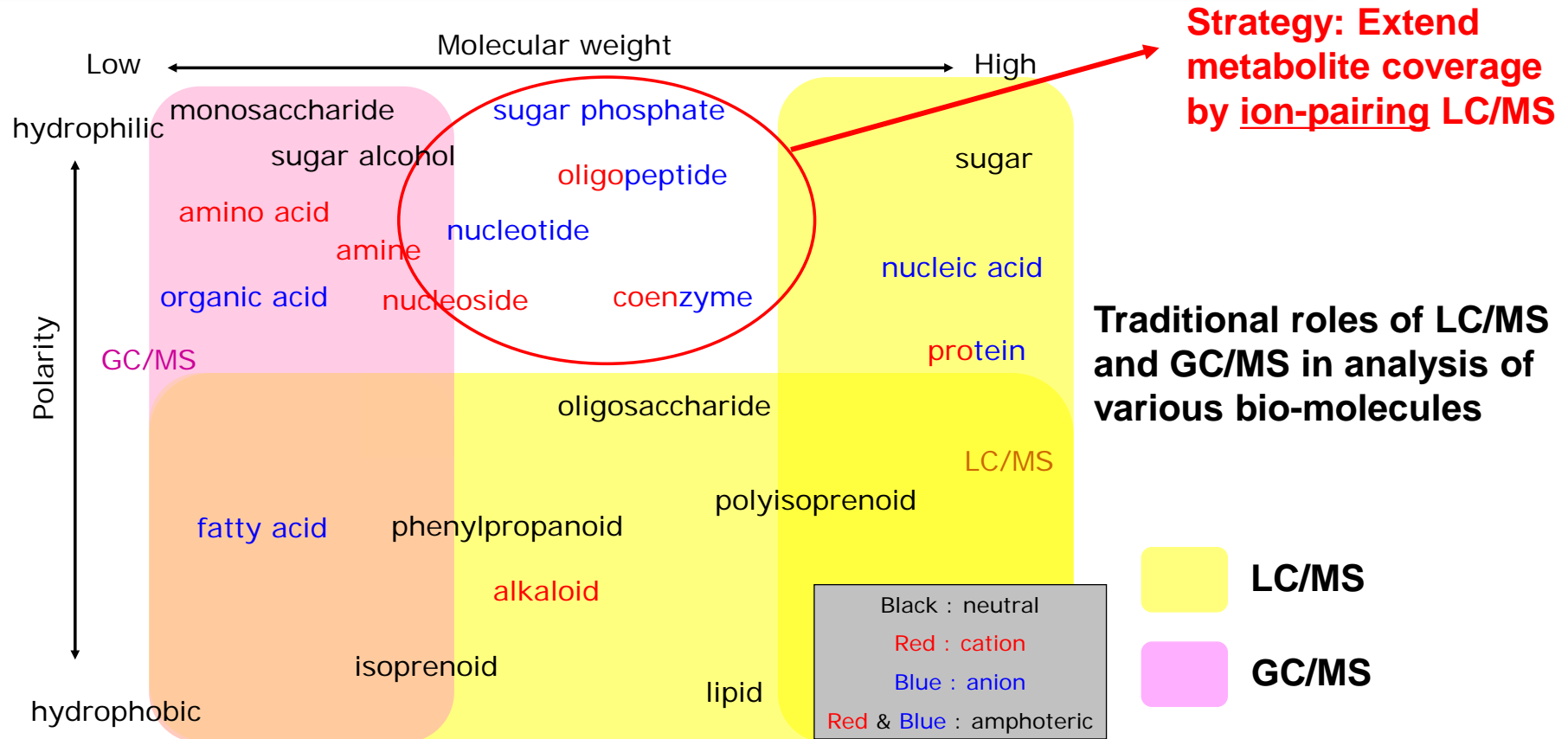


LC/MS-based microbial metabolomics platform development

An LC/MS analytical platform is developed for targeted analysis of a wide range of molecules in microbial (yeast) samples

Advantages of LC/MS:

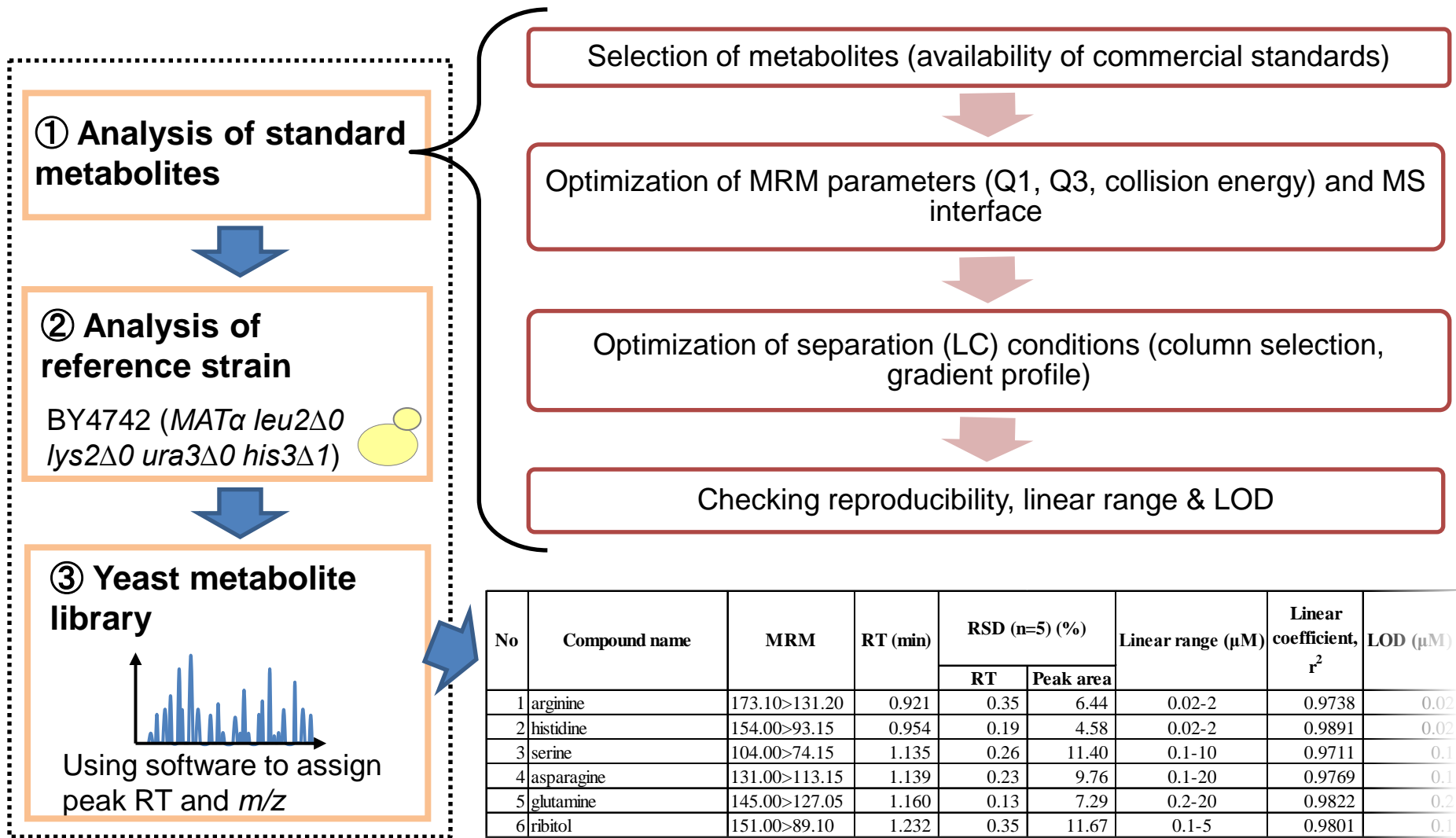
- ✓ Wide coverage of metabolites
- ✓ Easy sample preparation (no need for derivatization)
- ✓ Can be optimized by column chemistry and mobile phases





LC/MS-based microbial metabolomics platform development

LC/MS targeted analysis method development process



No	Compound name	MRM	RT (min)	RSD (n=5) (%)		Linear range (μ M)	Linear coefficient, r^2	LOD (μ M)
				RT	Peak area			
1	arginine	173.10>131.20	0.921	0.35	6.44	0.02-2	0.9738	0.02
2	histidine	154.00>93.15	0.954	0.19	4.58	0.02-2	0.9891	0.02
3	serine	104.00>74.15	1.135	0.26	11.40	0.1-10	0.9711	0.1
4	asparagine	131.00>113.15	1.139	0.23	9.76	0.1-20	0.9769	0.1
5	glutamine	145.00>127.05	1.160	0.13	7.29	0.2-20	0.9822	0.2
6	ribitol	151.00>89.10	1.232	0.35	11.67	0.1-5	0.9801	0.1
7	cysteine	120.00>33.00	1.237	0.07	4.58	0.05-5	0.9914	0.05
8	trehalose	341.00>89.00	1.237	0.34	4.43	0.05-5	0.9904	0.05