### Additional file 2

#### Japanese novice medical laboratory scientists’ competency

| Category          | Domain               | Competency item                                                                 |
|-------------------|----------------------|---------------------------------------------------------------------------------|
| Sample            | General              | 1 Collects specimen from patients safely and appropriately                        |
|                   | Venipuncture         | 2 Performs safe and comfortable venous blood collection of patients and stores it in an appropriate container |
| Preparation       | Pre-examination      | 3 Receives specimens appropriately                                              |
|                   | Process during the examination | 5 Prioritises analyses based on urgency and work efficiency                      |
|                   |                      | 6 Performs analyses of patients’ specimens, utilising appropriate testing methods and techniques |
|                   |                      | 7 Ensures that the test results are based on appropriate quality control        |
|                   | Post-examination     | 8 Assesses the validity of test results based on the clinical patient information and previous results |
|                   |                      | 9 Considers retesting, additional tests and so forth as necessary within established guidelines |
| Report test results | 10                  | Interprets verified results and reports test results with evidence              |
11 Reports critical test results in a way that draws attention to them, if guidance is provided

12 Uses laboratory system appropriately for retesting and reporting test results

Management of document

13 Stores and disposes test results and reports in consideration of personal information protection

14 Understands manuals and protocols correctly

Management of equipment and inventory

15 Manages the internal quality control of the test equipment being used

16 Understands the assessment results based on the correct knowledge of external quality control, if guidance is provided

17 Maintains the test equipment being used

18 Notices and reports abnormalities and defects of the test equipment being used

19 Coordinates the inventory of supplies and test-related items (e.g. reagents), if guidance is provided

| Preparation and analysis (specimens) | Pre-examination process | 20 Transports patients’ specimens safely and appropriately | 21 Evaluates whether specimens appropriate for testing have been collected (confirmation of specimen types) |
| Step | Description |
|------|-------------|
| 22   | Evaluates specimens’ suitability before testing |
| 23   | Evaluates the validity of test results by specimen types |
| 24   | Stores specimens safely and properly |
| 25   | Prepares and adjusts reagents and solutions required for testing and manages them under the direction of a supervisor (including staining solutions and culture media) |
| 26   | Guides the patient (examinee) appropriately into the physiological laboratory |
| 27   | Identifies the patient (examinee) properly prior to the physiological examination |
| 28   | Explains the test to the patient (examinee) properly before the physiological examination |
| 29   | Manages the safety control of physiological examination equipment |
| 30   | Performs safe and comfortable physiological examination of the patient |
| 31   | Understands the safe and appropriate environment of a laboratory |
| 32   | Identifies unsafe work practices and regulatory violations and consults with supervisors and senior staff as needed |
33 Understands various types of biohazards and follows correct procedures for specimen transport and disposal

34 Possesses the correct knowledge of infection prevention measures and practices them

35 Understands how to respond to emergencies, such as disasters and power outages, and is always prepared

36 Follows the hospital’s emergency response procedure manuals in the event of an acute deterioration of a patient (examinee)

37 Reports, communicates and consults on work-related matters

38 Treats patients (examinees) with respect

39 Communicates appropriately with medical professionals and related parties (including clinical trainees)

40 Performs the role of a member of the laboratory, if guidance and support are provided

41 Understands each role of medical professionals and collaborates with them, if guidance is provided
| Professional development | Academic activity | 42 | Understands the importance of team medicine and participates as a member of the team, if guidance is provided |
|-------------------------|-------------------|----|---------------------------------------------------------------------------------------------------------|
|                         |                   | 43 | Understands the importance of evidence-based medicine, if guidance is provided                           |
|                         |                   | 44 | Participates in workshops and conferences to maintain and update scientific knowledge and skills         |
| Self-improvement        |                   | 45 | Identifies one’s own issues and sets personal goals, if guidance is provided                             |
|                         |                   | 46 | Reflects on personal growth and makes connections to the next stage of growth                            |
|                         |                   | 47 | Recognises the importance of lifelong self-directed learning as a medical professional                   |
| Ethics                  | Professional responsibility | 48 | Reports one’s actions/inactions (oversights) and prevents them from recurring                          |
|                         |                   | 49 | Expresses one’s own professional thoughts according to the situation                                    |
|                         |                   | 50 | Is aware of being a member of an organisation and acts responsibly in the tasks assigned                 |
|                         |                   | 51 | Understands the principle of the medical institution and the goals of the laboratory one works for       |
Medical ethics 52 Is aware of professionalism and adheres to the profession’s code of ethics

53 Understands basic laws and policies related to healthcare (e.g. Personal Information Protection Law, medical insurance system, etc.)

54 Conducts tests (examinations) without disadvantages to the patient (examinee)