

## Summary of status of development and availability of A(H5N1) candidate vaccine viruses and potency testing reagents

20 February 2019

### Candidate vaccine viruses

| Antigenic prototype           | Clade    | Candidate vaccine virus | Developing institute                 | Available from         |
|-------------------------------|----------|-------------------------|--------------------------------------|------------------------|
| A/Vietnam/1194/2004           | 1        | Wild type virus         |                                      | WHO CCs                |
|                               |          | NIBRG-14*               | NIBSC, UK                            | NIBSC, UK              |
| A/Vietnam/1203/2004           | 1        | Wild type virus         |                                      | WHO CCs                |
|                               |          | SJRG-161052*            | CDC, USA<br>SJCRH, USA<br>HKU, China | SJCRH, USA<br>CDC, USA |
| A/Cambodia/R0405050/2007      | 1.1      | Wild type virus         |                                      | WHO CCs                |
|                               |          | NIBRG-88*               | NIBSC, UK                            | NIBSC, UK              |
| A/Cambodia/X0810301/2013      | 1.1.1    | Wild type virus         |                                      | WHO CCs                |
|                               |          | IDCDC-RG34B*            | CDC, USA                             | CDC, USA               |
| A/duck/Hunan/795/2002         | 2.1      | Wild type virus         |                                      | WHO CCs                |
|                               |          | SJRG-166614*            | SJCRH, USA<br>HKU, China             | SJCRH, USA             |
| A/Indonesia/5/2005            | 2.1.3.2  | Wild type virus         |                                      | WHO CCs                |
|                               |          | IDCDC-RG2*              | CDC, USA                             | CDC, USA               |
| A/Indonesia/NIHRD11771/2011   | 2.1.3.2a | Wild type virus         |                                      | WHO CCs                |
|                               |          | NIIDRG-9*               | NIID, Japan<br>NIHRD, Indonesia      | NIID, Japan            |
| A/chicken/India/NIV33487/2006 | 2.2      | Wild type virus         |                                      | WHO CCs                |
|                               |          | IBCDC-RG7*              | NIV, India<br>CDC, USA               | NIV, India<br>CDC, USA |

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|-----------------------------------------------|----------|-------------------------|--------------------------|-------------------------|
| <b>A/bar headed goose/Qinghai/1A/2005</b>     | 2.2      | Wild type virus         |                          | WHO CCs                 |
|                                               |          | <b>SJRG-163222*</b>     | SJCRH, USA<br>HKU, China | SJCRH, USA              |
| <b>A/whooper swan/Mongolia/244/2005</b>       | 2.2      | Wild type virus         |                          | WHO CCs                 |
|                                               |          | <b>SJRG-163243*</b>     | SJCRH, USA               | SJCRH, USA              |
| <b>A/turkey/Turkey/1/2005</b>                 | 2.2.1    | Wild type virus         |                          | WHO CCs                 |
|                                               |          | <b>NIBRG-23*</b>        | NIBSC, UK                | NIBSC, UK               |
| <b>A/Egypt/2321-NAMRU3/2007</b>               | 2.2.1    | Wild type virus         |                          | WHO CCs                 |
|                                               |          | <b>IDCDC-RG11*</b>      | CDC, USA                 | CDC, USA                |
| <b>A/Egypt/N03072/2010</b>                    | 2.2.1    | Wild type virus         |                          | WHO CCs                 |
|                                               |          | <b>IDCDC-RG29*</b>      | CDC, USA                 | CDC, USA                |
| <b>A/Egypt/3300-NAMRU3/2008</b>               | 2.2.1.1  | Wild type virus         |                          | WHO CCs                 |
|                                               |          | <b>IDCDC-RG13*</b>      | CDC, USA                 | CDC, USA                |
| <b>A/Egypt/N04915/2014</b>                    | 2.2.1.2  | Wild type virus         |                          | WHO CCs                 |
|                                               |          | <b>NIBRG-306*</b>       | NIBSC, UK                | NIBSC, UK               |
| <b>A/common magpie/Hong Kong /5052/2007</b>   | 2.3.2.1  | Wild type virus         |                          | WHO CCs                 |
|                                               |          | <b>SJRG-166615*</b>     | SJCRH, USA<br>HKU, China | SJCRH, USA              |
| <b>A/Hubei/1/2010</b>                         | 2.3.2.1a | Wild type virus         |                          | WHO CCs                 |
|                                               |          | <b>IDCDC-RG30*</b>      | CCDC, China<br>CDC, USA  | CCDC, China<br>CDC, USA |
| <b>A/duck/Bangladesh/19097/2013</b>           | 2.3.2.1a | Wild type virus         |                          | WHO CCs                 |
|                                               |          | <b>SJ001*</b>           | SJCRH, USA               | SJCRH, USA              |
| <b>A/barn swallow/Hong Kong/D10-1161/2010</b> | 2.3.2.1b | Wild type virus         |                          | WHO CCs                 |
|                                               |          | <b>SJ-003*</b>          | SJCRH, USA<br>HKU, China | SJCRH, USA              |

| Antigenic prototype                          | Clade    | Candidate vaccine virus | Developing institute     | Available from          |
|----------------------------------------------|----------|-------------------------|--------------------------|-------------------------|
| <b>A/duck/Viet Nam/NCVD-1584/2012</b>        | 2.3.2.1c | Wild type virus         |                          | WHO CCs                 |
|                                              |          | <b>NIBRG-301*</b>       | NIBSC, UK                | NIBSC, UK               |
| <b>A/duck/Laos/3295/2006</b>                 | 2.3.4    | Wild type virus         |                          | WHO CCs                 |
|                                              |          | <b>CBER-RG1*</b>        | CBER/FDA, USA            | CBER/FDA, USA           |
| <b>A/Anhui/1/2005</b>                        |          | Wild type virus         |                          | WHO CCs                 |
|                                              | 2.3.4    | <b>IDCDC-RG6*</b>       | CDC, USA                 | CDC, USA                |
| <b>A/Japanese white eye/HK/1038/2006</b>     | 2.3.4    | Wild type virus         |                          | WHO CCs                 |
|                                              |          | <b>SJRG-164281*</b>     | SJCRH, USA<br>HKU, China | SJCRH, USA              |
| <b>A/chicken/Hong Kong/AP156/2008</b>        | 2.3.4    | Wild type virus         |                          | WHO CCs                 |
|                                              |          | <b>SJ-002*</b>          | SJCRH, USA<br>HKU, China | SJCRH, USA              |
| <b>A/chicken/Bangladesh/11rs1984-30/2011</b> | 2.3.4.2  | Wild type virus         |                          | WHO CCs                 |
|                                              |          | <b>IDCDC-RG36*</b>      | CDC, USA                 | CDC, USA                |
| <b>A/Guizhou/1/2013</b>                      | 2.3.4.2  | Wild type virus         |                          | WHO CCs                 |
|                                              |          | <b>IDCDC-RG35*</b>      | CCDC, China<br>CDC, USA  | CCDC, China<br>CDC, USA |
| <b>A/goose/Guiyang/337/2006</b>              | 4        | Wild type virus         |                          | WHO CCs                 |
|                                              |          | <b>SJRG-165396*</b>     | SJCRH, USA<br>HKU, China | SJCRH, USA              |
| <b>A/chicken/Vietnam/NCVD-016/2008</b>       | 7.1      | Wild type virus         |                          | WHO CCs                 |
|                                              |          | <b>IDCDC-RG12*</b>      | CDC, USA                 | CDC, USA                |
| <b>A/chicken/Vietnam/NCVD-03/2008</b>        | 7.1      | Wild type virus         |                          | WHO CCs                 |
|                                              |          | <b>IDCDC-RG25A*</b>     | CDC, USA                 | CDC, USA                |

\*These viruses are candidate vaccine viruses which have passed relevant safety testing and two-way haemagglutination inhibition (HI) tests. They can be handled under BSL-2 enhanced containment<sup>1</sup>.

<sup>1</sup> <http://www.who.int/biologicals/publications/trs/areas/vaccines/influenza/Annex%205%20human%20pandemic%20influenza.pdf?ua=1>

## Candidate vaccine viruses in preparation

| Antigenic prototype            | Clade    | Developing Institute     | Available from |
|--------------------------------|----------|--------------------------|----------------|
| A/chicken/Guiyang/1153/2016    | 2.3.2.1c | SJCRH, USA<br>HKU, China | Pending        |
| A/chicken/Ghana/20/2015        | 2.3.2.1c | CDC, USA                 | Pending        |
| A/duck/Bangladesh/17D1012/2018 | 2.3.2.1a | CDC, USA                 | Pending        |
| A/environment/Hubei/950/2013   | 7.2      | CCDC, China              | Pending        |

## Institutes contact details for candidate vaccine virus orders and other information:

CBER/FDA: [CBERshippingrequests@fda.hhs.gov](mailto:CBERshippingrequests@fda.hhs.gov)

CDC: [dwentworth@cdc.gov](mailto:dwentworth@cdc.gov) (subject: CVV request)

CCDC: [whocc-china@cnic.org.cn](mailto:whocc-china@cnic.org.cn)

NIBSC: [standards@nibsc.org](mailto:standards@nibsc.org) or [enquiries@nibsc.org](mailto:enquiries@nibsc.org)

NIID: [nobusawa@nih.go.jp](mailto:nobusawa@nih.go.jp)

NIV: [niv.influenza@gmail.com](mailto:niv.influenza@gmail.com)

HKU: [malik@hkucc.hku.hk](mailto:malik@hkucc.hku.hk)

SJCRH: [richard.webby@stjude.org](mailto:richard.webby@stjude.org)

WHO CCs: [http://www.who.int/influenza/gisrs\\_laboratory/collaborating\\_centres/list/en/](http://www.who.int/influenza/gisrs_laboratory/collaborating_centres/list/en/)

## Reference antigens (freeze dried)

| Starting materials                 |                   | Ref Ag<br>Lot number | Unitage<br>(µgHA/ml) | Available<br>from |
|------------------------------------|-------------------|----------------------|----------------------|-------------------|
| Parent virus                       | CVV               |                      |                      |                   |
| A/Vietnam/1194/2004                | NIBRG-14          | 09/184               | 67                   | NIBSC, UK         |
| A/turkey/Turkey/1/2005             | NIBRG-23          | 07/112               | 80                   | NIBSC, UK         |
| A/Anhui/1/2005                     | IDCDC-RG6         | 07/290               | 99                   | NIBSC, UK         |
| A/Cambodia/R0405050/2007           | NIBRG-88          | 08/216               | 93                   | NIBSC, UK         |
| A/Vietnam/1203/2004                | 161052<br>(SJCRH) | 50                   | 152                  | CBER/FDA,<br>USA  |
| A/Indonesia/5/2005                 | IDCDC-RG2         | 0904                 | 77                   | CBER/FDA,<br>USA  |
|                                    |                   | 2013/99B             | 85                   | TGA,<br>Australia |
| A/Bar-headed goose/Qinghai/1A/2005 | 163222<br>(SJCRH) | 63                   | 69                   | CBER/FDA,<br>USA  |

## Sheep antisera

| Antisera directed against               | Order Lot number    | Available from |
|-----------------------------------------|---------------------|----------------|
| A/Anhui/1/2005-like                     | 07/338              | NIBSC, UK      |
|                                         | 08/142              | NIBSC, UK      |
| A/Cambodia/R0405050/2007-like           | 08/210              | NIBSC, UK      |
| A/Hong Kong/489/97-like                 | 98/666              | NIBSC, UK      |
| A/Vietnam/1203/2004-like                | S-124, S-125        | CBER/FDA, USA  |
| A/Indonesia/5/2005-like                 | S-7854              | CBER/FDA, USA  |
|                                         | AS406               | TGA, Australia |
| A/Bar-headed goose/Qinghai/1A/2005-like | S-112SP             | CBER/FDA, USA  |
| A/Vietnam/1194/2004-like                | 07/148              | NIBSC, UK      |
|                                         | 09/192              | NIBSC, UK      |
| A/turkey/Turkey/1/2005-like             | 06/192              | NIBSC, UK      |
|                                         | 08/126 <sup>§</sup> | NIBSC, UK      |
| A/duck/Viet Nam/NCVD-1584/2012-like     | 14/318              | NIBSC, UK      |

<sup>§</sup> Anti NA serum for tests of neuraminidase identification

## WHO Essential Regulatory Laboratories (ERLs) contact details for reagent orders and other information:

CBER/FDA: [CBERShippingRequests@fda.hhs.gov](mailto:CBERShippingRequests@fda.hhs.gov)  
 NIBSC: [standards@nibsc.org](mailto:standards@nibsc.org) or [enquiries@nibsc.org](mailto:enquiries@nibsc.org)  
 TGA: [influenza.reagents@tga.gov.au](mailto:influenza.reagents@tga.gov.au)

Candidate vaccine viruses and potency testing reagents for influenza A(H5) non-A(H5N1) can be found on the WHO web site at  
[http://www.who.int/influenza/vaccines/virus/candidates\\_reagents/a\\_h5/en/](http://www.who.int/influenza/vaccines/virus/candidates_reagents/a_h5/en/)

For information of other type and subtype candidate vaccine viruses and potency testing reagents, please go to: <http://www.who.int/influenza/vaccines/virus/en/>

For general enquiries, please contact [gisrs-whohq@who.int](mailto:gisrs-whohq@who.int)