Stem cells from anyone?

by Bend_Weekly_News_Sources

OrÂ-diÂ-nary cells of the body can be â€œreÂ-proÂ-grammedâ€• to beÂ-come markedly siÂ-mÂ-iÂ-lar to stem cells, the â€œmasÂ-ter cellsâ€• that can grow inÂ-to many difÂ-ferÂ-ent orÂ-gans and cure a range of disÂ-eases, sciÂ-enÂ-tists say.The findÂ-ings are stirÂ-ring exÂ-citeÂ-ment beÂ-cause stem cells are norÂ-mally obÂ-tainÂ-able only from emÂ-bryos, a proÂ-cess that orÂ-diÂ-narily kills the emÂ-bryos and is thus fraught with ethÂ-iÂ-cal conÂ-troÂ-verÂ-sy.ReÂ-searchÂ-ers have beÂ-gun figÂ-urÂ-ing out ways to create stem cells without kilÂ-ling embÂ-ryos in the past few years. A new apÂ-proach reported this week both builds and imÂ-proves on some of these strateÂ-gies, and could alÂ-so sideÂ-step conÂ-cerns about tisÂ-sue reÂ-jecÂ-tion that acÂ-comÂ-paÂ-ny othÂ-er stem cell treatÂ-ments, reÂ-searchÂ-ers said. This is beÂ-cause the new proÂ-ceÂ-dure raises the posÂ-siÂ-bilÂ-ity of a paÂ-tient beÂ-ing treated with stem cells from his or her own body, proÂ-vidÂ-ing an exÂ-act geÂ-netÂ-ic match.KonÂ-rad Hochedlinger of the MasÂ-saÂ-chuÂ-setts GenÂ-erÂ-al HosÂ-piÂ-tal in Boston and colÂ-leagues worked with a preÂ-viÂ-ously deÂ-velÂ-oped techÂ-nique in which four genes were added to comÂ-mon cells called fiÂ-brobÂ-lasts in mice. FiÂ-brobÂ-lasts are plenÂ-tiÂ-ful in the skin. In preÂ-viÂ-ous studÂ-ies, the proÂ-ceÂ-dure had reÂ-sulted in â€œre-settingâ€• the cellsâ€™ geÂ-netÂ-ic strucÂ-ture to make them siÂ-mÂ-iÂ-lar to stem cells, but with some noÂ-taÂ-ble difÂ-ferÂ-ences. Hochedlingerâ€™s team comÂ-bined this apÂ-proach with a new proÂ-ceÂ-dure that alÂ-lowed them to choose only the genÂ-erÂ-atÂ-ed cells that met cerÂ-tain geÂ-netÂ-ic speÂ-cifÂ-icaÂ-tÂ-ions. This led them to find cells that they called indisÂ-tinÂ-guishÂ-able, based on sevÂ-erÂ-al tests, from emÂ-bryÂ-onÂ-ic stem cells.ExÂ-perts cauÂ-tioned that it will still be a long time beÂ-fore such techÂ-niques can be perÂ-fected and used in huÂ-mans, but that the reÂ-sults are promÂ-isÂ-ing.The reÂ-searchÂ-ers went on to show that the newly genÂ-erÂ-atÂ-ed cells could difÂ-ferÂ-entiate inÂ-to a wide range of cell types, inÂ-cludÂ-ing blood cells and egg cells. Hochedlingerâ€™s findÂ-ings apÂ-pear in the inÂ-auÂ-guÂ-ral July isÂ-sue of a new reÂ-search jourÂ-nal, Cell Stem Cell, an afÂ-filÂ-iÂ-ate pubÂ-licaÂ-tÂ-ion of the jourÂ-nal Cell.Two reÂ-latÂ-ed studÂ-ies apÂ-pear in the July 7 isÂ-sue of the jourÂ-nal NaÂ-ture. One of these found that stem-like cells siÂ-mÂ-iÂ-lar to those of HoÂ-chÂ-edÂ-linÂ-gerâ€™s team could give rise to ferÂ-tiÂ-lized emÂ-bryos, alÂ-though these latÂ-er died. A secÂ-ond paÂ-per, by a team inÂ-cludÂ-ing Shinya YaÂ-manaka of KyoÂ-to UnÂ-iversÂ-ity, JaÂ-panâ€”who piÂ-oÂ-neered the techÂ-nique of usÂ-ing the four genes to reÂ-proÂ-gram cellsâ€”atÂ-tempted to inÂ-ject siÂ-mÂ-iÂ-lar cells inÂ-to early deÂ-velÂ-opÂ-ing mouse emÂ-bryos. The mice reached adulÂ-thood and the reÂ-proÂ-grammed cells conÂ-triÂ-butÂ-ed to and funcÂ-tioned in varÂ-iÂ-ous orÂ-gans, they found. A setÂ-back was that 20 perÂ-cent of these mice deÂ-velÂ-oped canÂ-cer, which was blamed on one of the four genes used in the reÂ-proÂ-gramming proÂ-cess, called c-myc.â€œThere may be ways to overÂ-come this probÂ-lem,â€• YaÂ-manaka and colÂ-leagues wrote. The auÂ-thors of the othÂ-er NaÂ-ture paÂ-per, RuÂ-dolf JaeÂ-nisch of the WhiteÂ-head InÂ-stiÂ-tute for BiÂ-oÂ-medÂ-iÂ-cal ReÂ-search in CamÂ-bridge, Mass. and colÂ-leagues, wrote that the findÂ-ings inÂ-diÂ-cate that orÂ-diÂ-nary cells poÂ-tenÂ-tially can be reÂ-proÂ-grammed to beÂ-come â€œsimÂ-iÂ-lar, if not idenÂ-tiÂ-calâ€• to emÂ-bryÂ-onÂ-ic stem cells. Courtesy World Science